

Effects of the Peer Group on the Development of Social Functioning and Academic Achievement: A Longitudinal Study in Chinese Children

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This longitudinal study examined, in a sample of Chinese children (initial mean ages = 9.5 and 12.7 years, $N = 505$), how the peer group contributed to social functioning and academic achievement and their associations. Data on informal peer groups, social functioning, and academic achievement were collected from multiple sources. Multilevel structural equation modeling revealed that group academic performance made direct contributions to children's social development. Group academic performance also moderated the individual-level relations between academic performance and later social functioning. Whereas high-achieving groups strengthened the positive relations between academic achievement and social competence, low-achieving groups facilitated the negative relations between academic achievement and social problems. The results indicate the significance of the peer group for social functioning from a developmental perspective.

From middle childhood to adolescence, the peer group represents a salient social phenomenon that has pervasive influences on children's attitudes and behaviors (Bagwell, Coie, Terry, & Lochman, 2000; Brown & Klute, 2003; Cairns, Leung, Buchanan, & Cairns, 1995; Kandel, 1978). Researchers have found in the West that peer groups may affect individual social and psychological adjustment such as academic motivation, school dropout, early pregnancy, substance use, and life adjustment (e.g., Cairns & Cairns, 1994; Dishion, McCord, & Poulin, 1999; Kinderman, McCollom, & Gibson, 1995; Xie, Cairns & Cairns, 2001).

In the present study, we were interested in how the peer group contributed to children's social functioning and academic achievement and their associations from a developmental perspective. It has been found that prosocial-cooperative behaviors and positive peer interaction styles are associated with academic achievement (Chen, Rubin, & Li, 1997; Welsh, Parke, Widaman, & O'Neil, 2001). In contrast, disruptive-aggressive behaviors and social problems are associated with learning difficulties and academic failure

(Dishion, 1990; Wentzel & Asher, 1995). Researchers have attempted to understand the personal and social conditions for the linkage between social functioning and academic achievement (e.g., Hinshaw, 1992). The peer group, as an important social context, is likely to play a role in determining how social functioning and academic achievement affect each other during development.

Academic Achievement, Social Functioning, and the Peer Group in Chinese Children

Academic achievement has been valued traditionally in Chinese culture and is a primary task for children in China today (Stevenson et al., 1990). Largely because of limited opportunities to receive a higher education, children are constantly pressured by their parents and teachers to perform optimally in school (e.g., Chang, Schwartz, Dodge, & McBride-Chang, 2003). Nevertheless, the goals of education in Chinese schools also include helping children develop appropriate social behaviors. Children are encouraged to develop cooperative and prosocial attitudes and behaviors and to learn social skills to maintain harmonious relationships with others. At the same time, undercontrolled and disruptive behaviors, such as aggression and defiance, are often

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strictly prohibited (Chang, 2004). It has been found that whereas sociable–competent children are likely to adjust well in social and psychological areas, aggressive–disruptive children may display various social problems such as peer rejection and psycho-emotional difficulties in China (Chang, 2004; Chen, Cen, Li, & He, 2005).

Like their Western counterparts (e.g., Cairns & Cairns, 1994; Kinderman, 1993), the majority of school-age children in China are affiliated with a peer group (Chen, Chang & He, 2003; Leung, 1996; Sun, 1995). Peer groups in Chinese children comprise mostly same-sex members, with an average group size of 4–6 members. Groups vary considerably in their academic and social orientations (Chen et al., 2003; Leung, 1996). For example, some groups value academic achievement as a major norm and are organized on the basis of academic activities, but other groups consist of members who lack academic interest and are generally poor in achievement (Chen et al., 2003; Sun, 1995). Group variations on social orientations in Chinese children are characterized mostly by engaging in prosocial–cooperative and antisocial–destructive activities (e.g., Chen, Chen, & Kaspar, 2001). Prosocial–cooperative groups are represented by the tendency of group members to display socially acceptable and responsible behaviors and maintain positive relationships with others. In contrast, children in antisocial–destructive groups tend to display disruptive, hostile, and rebellious behaviors and experience difficulties in peer relationships (Chen, Kaspar, Zhang, Wang, & Zheng, 2004).

The Direct Contribution of the Peer Group to Later Social Functioning and Academic Achievement

Chinese culture emphasizes the role of the peer group in helping children learn social standards and develop socially valued behaviors (Luo, 1996; Sun, 1995). Thus, we expect that group context may affect social and academic development. On the basis of the peer relationship literature (e.g., Rubin, Bukowski, & Parker, 2006), we speculated that group context might affect individual development through various processes. Some of the processes, such as social learning and mutual support, may be similar to those in dyadic relationships between friends (e.g., Berndt, 2002; Hartup, 1992; Youniss & Smollar, 1985). The literature on peer homophily (Kandel, 1978; Hamm, 2000) suggests that similarity may be an important factor in friendship; children with similar qualities tend to attract each other, and after getting together, they start to socialize each other. The impact of group context may also occur through norm-based group processes

such as mutual regulation and within-group assimilation in group activities and group reputational effects (e.g., Brown, 1990; Cairns & Cairns, 1994; Harris, 1995). In an academically oriented or high-achieving group, for example, the common goal of pursuing academic achievement requires individuals to engage in social behaviors such as self-control and responsible behaviors that are conducive to learning (Wentzel & Asher, 1995). Given the importance of academic achievement in Chinese schools, group academic activities may also help members obtain social recognition and prestige (e.g., Chen et al., 2004). In academically poor groups, however, the common negative attitudes toward school work may lead to group approval and encouragement of deviant behaviors such as disruption of classroom instruction and violation of school rules, which eventually contribute to maladaptive social development (e.g., Cairns & Cairns, 1994).

Similarly, the social characteristics of the peer group may exert significant influence on later academic achievement. Groups that are established and maintained on the basis of prosocial and cooperative norms are likely to engage in socially valued activities such as doing homework and school projects together and help children acquire academic achievement (e.g., Chen et al., 2004; Sun, 1995). The cooperative context of the group may facilitate mutual support and assistance among group members in solving academic problems. In contrast, antisocial–destructive groups may endorse disruptive and defiant behaviors that undermine children’s learning in school. The antisocial activities in these groups may also hinder the development of intrinsic achievement motivation (Kinderman et al., 1995). Therefore, we hypothesized that the peer group would have direct main effects on social functioning and academic performance. We focused in this study on two main aspects of social functioning—social competence and social problems. Social competence was indicated by peer-assessed sociability, peer acceptance, teacher-rated competence, and leadership status, whereas social problems included peer-assessed aggression, peer rejection, and teacher-rated acting out.

The Peer Group as a Moderator of Relations Between Social Functioning and Academic Achievement

In addition to its direct or main effects, we were interested in how the peer group might moderate the relations between social functioning and academic performance. There are two general models in the literature (Cohen & Wills, 1985; Masten & Wright, 1998) that researchers commonly use to specify the processes

of moderation involving various social and personal factors including peer relationships. These two models led us to formulate corresponding hypotheses in the study concerning group-moderating effects. The first model, the stress-buffering model (Cohen & Wills, 1985), focuses on the *context of risk or adversity* (e.g., children with academic difficulties). According to this model, for the moderating effects of group academic context, high-achieving groups may serve as a protective factor that reduces the risk and protects academically poor children from developing maladaptive outcomes (increased social problems or decreased social competence), whereas low-achieving groups, which often endorse disruptive and rule-violating behaviors, serve as a vulnerability or an exacerbating factor that makes academically poor children particularly susceptible to later social problems. As a result, there are significant differences in social outcomes among academically poor children in high- and low-achieving groups. Statistically, this model may be represented by a significant individual-level relation (e.g., negative relation between academic achievement and social problems or positive relation between academic achievement and social competence) in low-achieving groups and a nonsignificant or weaker individual-level relation in high-achieving groups.

The second model is the resource-potentiating model (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995). This model focuses on the *context of low risk or high resources*. According to this model, the high-resources context serves to facilitate the strengths of the individuals who already have the advantage. The potentiating effect is displayed in the form of high-achieving groups facilitating the strengths of academically competent children and enhancing their positive social development (increased social competence or decreased social problems). Statistically, this model may be represented by a significant individual-level relation (e.g., negative relation between academic achievement and later social problems or positive relation between academic achievement and later social competence) in high-achieving groups and a nonsignificant or weaker individual-level relation in low-achieving groups. The different relations in high- and low-achieving groups are mainly due to their different effects on academically competent children (see Cohen & Wills, 1985; Kupersmidt et al., 1995; Masten & Wright, 1998, for further discussions of the interaction models).

Similarly, we proposed two alternative hypotheses for the moderating effects of group social context. According to the stress-buffering model, for socially incompetent or deviant children (i.e., children with low scores on social competence or high scores on

social problems), peer groups organized on prosocial and rule-abiding norms may serve as a buffering factor that protects those children from developing academic problems, whereas antisocial groups may exacerbate their academic difficulties. In contrast, according to the resource-potentiating model, prosocial-cooperative groups may enhance the academic achievement of socially competent children (children with high scores on social competence or low scores on social problems), whereas antisocial groups may impede their academic achievement. Therefore, prosocial-cooperative groups would strengthen the individual-level positive relations between social competence and later academic achievement, and socially destructive groups would strengthen the individual-level negative relations between social problems and later academic achievement.

Grade and Gender Differences

There are mixed findings in the peer group literature on grade/age differences. On the one hand, it has been argued that peer groups may become increasingly important with age for children to receive support when they attempt to establish autonomy from parents (e.g., Furman & Buhrmester, 1985). On the other hand, the literature (e.g., Rubin et al., 2006) indicates that children tend to be involved in relatively intensive and intimate clique interactions in childhood and, with age, increasingly attempt to pursue autonomous behaviors in group activities and maintain a balance between personal autonomy and the constraint of the group. The present study was conducted in a sample of children in elementary and junior high schools (initially in Grades 3 and 6). Although we expected that the impact of the group on individual development might be more evident in lower grades because of the relatively more intensive emotional involvement in clique interactions in childhood, we were open to other possibilities.

Concerning gender differences in group effects, whereas some researchers have reported that boys are more likely than girls to engage in group activities and that group activities are more influential in boys than in girls (e.g., Maccoby, 1995; Thorne & Luria, 2001), others have failed to find significant gender differences (e.g., Cairns et al., 1995; Tarrant, 2002). Moreover, certain groups such as acting-out and low-achieving groups may have greater effects on girls than on boys because, due to gender stereotypes, girls affiliated with these groups may be evaluated more negatively by others and experience greater pressure than boys in these groups. No gender differences in group characteristics or group effects have been reported

in Chinese children (Chen et al., 2003; Leung, 1996; Sun, 1995). Again, although on the basis of the argument of Maccoby (1995) we expected that group main and moderating effects might be stronger for boys than for girls, there might be different results including lack of gender effects, given that different, perhaps opposite, processes related to gender might operate in group functioning.

The Present Study

The primary purpose of the present study was to examine the role of the peer group in the development of social functioning and academic achievement and their associations in Chinese children. A sample of school children, initially in Grades 3 and 6, in Shanghai, People's Republic of China, participated in the 2-year longitudinal study. There are 5 years (Grades 1–5) in elementary schools and 4 years (Grades 6–9) in junior high schools in Shanghai. Students typically stay in the same class in elementary and junior high schools. The 2 years from third to fifth grade and from sixth to eighth grade represent important periods of social and academic development in Chinese children (e.g., Chen et al., 2004; Stevenson et al., 1990). Whereas children from third grade start to engage in extensive social interactions, form relatively stable networks, and experience increased academic pressure, it is important for children from sixth grade to establish support systems in their adjustment to the high school environment and display social skills to cope with interpersonal and school issues during the preadolescent period (e.g., Chang et al., 2003; Chen, Rubin, & Li, 1995). Previous studies (e.g., Chen & Li, 2000; Stevenson et al., 1990) have indicated considerable individual variations in developmental patterns during these 2 years in elementary and junior high schools; some children become increasingly competent and achieve success in various areas, but others may develop heightened socioemotional and school problems. It would be interesting to investigate how peer group experiences contribute to social and academic development in late childhood and preadolescence.

Researchers have used multilevel modeling such as hierarchical linear modeling (HLM) to examine the effects of the peer group on children's social behaviors and school achievement (Espelage, Holt, & Henkel, 2003; Ryan, 2001). These researchers have focused on group main effects on individual behaviors or performance. In a study of peer groups in Chinese children, Chen et al. (2003) examined the effects of group academic norms on the relations between individual academic achievement and social functioning. The study of Chen et al., however, was cross-sectional and

thus did not allow for a full assessment of group effects on bidirectional relations between social functioning and academic performance. Moreover, the influence of group context on individual behaviors is a developmental issue, which needs to be examined in longitudinal research.

The present longitudinal study represented an advancement of the research on the contextual effects of the peer group from a developmental perspective. The longitudinal data allowed us to address several issues that could not be addressed in cross-sectional studies such as group effects on the mutual contributions of social functioning and academic performance. Developmental researchers have been interested in peer relationships largely because they are believed to be associated with changes over time in children's behaviors and adjustment (Berndt, 2002). The experiences of group activities may have enduring implications for children's social and psychological adjustment (e.g., Brown, 1990; Rubin et al., 2006). This longitudinal project provided an opportunity for us to examine the effects of peer group experiences on children's later social functioning and academic achievement over and above their stabilities.

The main hypotheses are the following:

1. As the "main-effect" hypothesis, we expected that initial group social and academic performance would directly contribute to individual developmental outcomes with the stability effect controlled.
2. There were two alternative "moderating effect" hypotheses. We expected that group social and academic performance would moderate the individual-level longitudinal relations between academic achievement and social competence and problems according to (a) the stress-buffering model or (b) the resource-potentiating model, as discussed in the previous section.

Method

Participants

The original sample consisted of 256 third-grade children (128 boys and 128 girls) in an ordinary elementary school and 279 sixth-grade children (123 boys and 156 girls) in two ordinary junior high schools in Shanghai, People's Republic of China. Unlike a small number of "key" schools in the city in which students were often selected from different areas on the basis of their school performance, students in ordinary schools came from the residential areas in which the school is located. The children were in five

classes in Grade 3 and six classes in Grade 6, with approximately 50 students in each class. The mean ages of children were 9 years 6 months and 12 years 8 months ($SD = 8$ and 10 months) in Grades 3 and 6, respectively. The curriculum, which was identical throughout schools of the region, consisted of Chinese, mathematics, English, and other courses such as art. The structure and organization of elementary and junior high schools are similar in China. Students are encouraged to participate in a variety of extracurricular social and academic activities in school, which provides extensive opportunities for children to interact with each other. One teacher is designated to be in charge of a class. This head teacher often teaches one major course and takes care of the social and daily activities of the class. Students are not allowed to switch classrooms. Students spend roughly the same amount of time in the classroom. The schedule of courses and other activities is typically identical for students in the same class.

Almost all the children (98%) were from intact families. Approximately one third of the parents had a scholastic occupation such as teacher, doctor, engineer, or official; their educational levels ranged mainly from college to university graduate. The other parents were nonprofessional workers, with an educational level of high school or below high school. Due to the "one-child-per-family" policy, 92% of the children were only children in the family. Nonsignificant differences were found between the different types of families on the variables or relations of interest in the study. The demographic data for the sample were similar to those reported by the China State Statistics Bureau concerning urban population in China (e.g., *Bulletin*, 2000). The sample was representative of school children in urban China.

The follow-up data were collected 2 years later in the same schools. The complete sample in the follow-up study included 265 fifth-grade children and 322 eighth-grade children. Among them, 469 students (213 boys and 256 girls) were from the original sample; the others did not participate in the study mainly because they moved to different schools. The proportions of children in the two grades were nonsignificantly different at Times 1 and 2. Nonsignificant differences were found on Time 1 variables between children who participated in the follow-up study and those who did not. The data were collected near the end of the school year (May and June) at each time.

Procedure

At both Times 1 and 2, we group administered to the children a peer assessment measure of social

behaviors and a sociometric nomination measure. Teachers were requested to complete a rating scale for each participant concerning his/her school-related social competence, behavioral problems, and learning problems. Data concerning children's leadership and academic achievement were obtained from school records. In addition, at Time 1, a measure of social networks and groups (Cairns, Garipey, & Kindermann, 1989) was administered to the children.

The Western-based measures were translated and back-translated to ensure comparability with the English versions. These measures have proved appropriate and valid in Chinese and other cultures (e.g., Casiglia, Lo Coco, & Zappulla, 1998; Chen et al., 1997). The administration of all measures was carried out by a group of psychology teachers and graduate students at Shanghai Teachers' University. Written consent was obtained from all children and their parents through the school. The participation rate was 95% at each time.

Measures

Peer assessments of social behaviors. We administered to the children peer assessments of social behaviors, *The Revised Class Play* (Masten, Morison, & Pellegrini, 1985). During administration, the research assistant read each of the behavioral descriptors (e.g., "Someone who is a good leader"), and children were requested to nominate up to three classmates who could best play the role if they were to direct a class play. Children were asked to nominate students in their own class. When all children completed their nominations, they turned to the next item, until nominations for all 30 items were obtained. Subsequently, nominations received from all classmates were used to compute each item score for each child. The item scores were standardized within the class to adjust for differences in the number of nominators.

The original Class Play measure consisted of items in broad areas including sociability–leadership, aggression–disruption, and shyness–isolation (Masten et al., 1985). Only sociability–leadership and aggression–disruption were of interest in the present study. The items on sociability–leadership tapped several aspects of social competence (e.g., "makes new friends easily," "helps others when they need it," "polite"). Items in aggression–disruption were concerned with physical and verbal aggressive behaviors (e.g., "gets into a lot of fights," "picks on other kids"). Confirmatory factor analysis indicated that the items represented the corresponding factors. Previous studies have shown that the measure is reliable, valid, and

appropriate in Chinese children (see Chen et al., 1995, for test–retest reliabilities). Internal consistency in the present study was .97 and .95 for sociability and .86 and .91 for aggression in Grades 3 and 6, respectively, at Time 1, and .97 and .91 for sociability and .88 and .86 for aggression in Grades 5 and 8, respectively, at Time 2.

Teacher ratings. The head teacher in each class was asked to complete the Teacher–Child Rating Scale (T–CRS, based on Hightower et al., 1986) for each participant in his/her class (approximately 50 students). Teachers were asked to rate, on a 5-point scale, how well each of the items described the child. Three factors were identified through confirmatory factor analysis: (a) school-related social competencies (e.g., “participates in class discussion”), (b) acting out (e.g., “disruptive in class”), and (c) learning problems (“having problems in learning academic subjects”). Accordingly, three variables were formed on the basis of the corresponding items. The total scores on each subscale were standardized within the class to allow for appropriate comparisons. The T–CRS has proved reliable and valid in Chinese children (e.g., Chen et al., 1995, 1997). Internal consistencies in this study were .91 and .90 for school competence, .84 and .83 for acting out, and .81 and .80 for learning problems in Grades 3 and 6, respectively, at Time 1, and .94 and .93 for school competence, .84 and .82 for acting out, and .88 and .85 for learning problems in Grades 3 and 6, respectively, at Time 2.

Sociometric nominations. Each child was asked to nominate up to three classmates with whom he/she most liked to be and three classmates with whom he/she least liked to be (“Tell us the classmates you most like to be with/you would rather not be with”—positive and negative nominations). As suggested by other researchers (e.g., Coie, Terry, Lenox, Lochman, & Hyman, 1995), both same- and cross-sex nominations were allowed. The nominations received from all classmates were totaled and then standardized within each class to permit appropriate comparisons. Positive and negative nominations received from peers provided indexes of how a child was liked and disliked by peers in the class. The measure has been proved to be reliable and valid in Chinese children (e.g., Chen et al., 1995).

Leadership. In Chinese schools, there are various formal student organizations. “Leaders” of these organizations, elected by peers and teachers, are usually believed to be good students, especially in aspects of behavior and morality. Data on student leadership were collected from school records in the present study. Leadership was coded as follows: students who held leadership positions received

a score of 1 and those who did not were given a score of 0. The mean score of leadership was .25 and .27 ($SDs = 0.43$ and 0.46) in Grades 3 and 6, respectively, at Time 1, and .24 and .25 ($SDs = 0.40$ and 0.44) in Grades 5 and 8, respectively, at Time 2. This information has proved to be a useful and reliable indicator of social competence in Chinese children (e.g., 2-year stability was 0.72; Chen et al., 1995). The validity of the measure has been demonstrated in several studies in predicting Chinese children’s social and psychological adjustment (e.g., Chen et al., 1997).

Academic achievement. Information concerning academic achievement in Chinese, mathematics, and English courses was obtained for all participants from the school records. The scores of academic achievement were based on objective examinations conducted by the school. The maximum score for each of Chinese, mathematics, and English courses was 100; a test score of 60 is usually considered the cutoff between a pass and a failure in a course. In the present study, scores in Chinese, mathematics, and English courses were summed to form a single index of academic achievement (possible range = 0–300). The mean score of this variable was 250.36 and 241.78 ($SDs = 60.21$ and 35.08) in Grades 3 and 6, respectively, at Time 1, and 253.68 and 223.94 ($SDs = 27.09$ and 44.18) in Grades 5 and 8, respectively, at Time 2.

Peer social groups. A “composite social cognitive map” technique, developed by Cairns et al. (1989), was adopted to identify children’s natural social groups. This technique taps children’s independent perceptions of network relationships in the classroom and, thus, is particularly useful for research in different cultures because it focuses on the inquiry of social contexts from an “insiders’ perspective.” The participants were asked to report both their own and others’ peer groups in their class (“Are there people in school who hang around together a lot? Who are they?” “Do you have a group you hang around together a lot in school? Who are these people you hang around with?”). Based on the reports of all participants, a co-occurrence matrix was constructed from the number of occasions that any two persons co-occurred in the same group. Specifically, each participant’s group membership profile was first generated on the basis of the frequencies of nominations of group membership with every other child in the class. Then, a profile similarity index was derived by correlating pairs of individual group membership profiles. Children with similar group membership profiles were clustered into the same group based on a $r > .40$ cutoff point (Cairns & Cairns, 1994). A computer program (Leung, 1998) was used to assist in

identifying peer affiliations. As required by multilevel analysis, children who were associated with more than one group (19%) were assigned the membership of the predominant group for which the child received the most nominations or the highest centrality status. The method has proved effective in identifying peer groups and networks in Western and Chinese children (see Chen et al., 2001; Kinderman, 1993; Leung, 1996, for detailed descriptions). The peer groups were moderately stable; the stabilities over 2 years were 54.0% and 43.8% in Grades 3 and 6, respectively, when the loose criterion ($\geq 50\%$ of members remained in the group; Cairns et al., 1995) was employed, and 23.5% and 16.7% in Grades 3 and 6, respectively, when the stringent criterion ($\geq 75\%$ of members remained in the group) was employed.

Analytical Strategies

We used Mplus (Múthen & Múthen, 2003) to conduct multilevel structural equation modeling (ML-SEM) to examine the structural relations among different social and academic variables. These analyses have the advantage over the "traditional" multilevel analysis such as HLM by incorporating a measurement model to account for measurement errors. The structural relations were tested in separate analyses involving Time 2 academic performance, social competence, and social problems each as the Level 1 criterion variable. In these analyses, the corresponding Time 1 variable was included as a control variable to control for stability. The effects of group social and academic variables were examined at Level 2.

Results

Descriptive Data

Following the procedure developed by Cairns et al. (1989) and Kinderman (1993), 117 groups (50 male groups, 54 female groups, and 13 mixed-gender groups), consisting of 505 participants (94.4%), were identified in the sample. Thirty children did not belong to any groups and were excluded from the analyses of group effects. Multivariate analyses of variance indicated nonsignificant overall differences between group members and nonmembers on the social and academic variables. The average group size was 4.48, 4.74, and 5.38 ($SDs = 2.92, 2.62, \text{ and } 2.79$) for male, female, and mixed-gender groups, respectively. There were nonsignificant gender and grade differences in group size and the percentage of children who were affiliated with a group.

Intercorrelations among the variables and group-level descriptive data including means, standard deviations, and ranges of group scores at each time are presented in Table 1. The Box M test on covariance matrix indicated nonsignificant grade or gender differences in the overall patterns of correlations. Nevertheless, we tested grade and gender differences on individual correlations and found that correlations between peer-assessed aggression and negative sociometric nominations and between teacher-rated acting out and negative sociometric nominations at Time 2 were significantly stronger in Grade 3, $r_s = .75$ and $.44$, $p_s < .001$ and $.001$, than in Grade 6, $r_s = .41$ and $.13$, $p_s < .001$ and $.05$, respectively, $Z_s < .01$. In addition, correlations between teacher-rated learning problems and negative sociometric nominations at Time 1, between teacher-rated acting out and teacher-rated competence at Time 2, and between teacher-rated learning problems and teacher-rated competence at Time 2 were significantly stronger for boys, $r_s = .33, -.46, \text{ and } -.49$, $p_s < .001, .001, \text{ and } .001$, than for girls, $r_s = .06, -.21, \text{ and } -.21$, $p_s > .05, < .001, \text{ and } < .001$, respectively, $Z_s < .01$. The corresponding correlations in the two grades and for boys and girls were in the same direction. The differences in these individual correlations should be interpreted with caution, given the nonsignificant grade or gender differences in the overall patterns.

We conducted a multilevel confirmatory factor analysis (Múthen & Múthen, 2003) to test the measurement model of latent constructs at both within-group individual and between-group levels. The analyses were based on children in 117 groups. To maintain adequate within-group variances for the analyses of longitudinal relations, we imputed Time 2 missing data (7.13% missing values) for the children who did not participate in the follow-up study based on their Time 1 data, using the full information maximum likelihood estimates, as recommended by other authors (e.g., Duncan, Duncan, & Li, 1998; Schafer & Graham, 2002). The three constructs and their measurements, consistent at Times 1 and 2, are as follows. Social competence was measured by peer-assessed sociability, positive sociometric nominations, teacher-rated social competence, and leadership. Social problems included peer-assessed aggression, negative sociometric nominations, and teacher-rated acting out. Academic performance included composite scores of Chinese, English, and mathematics and reversed scores of teacher-rated learning problems. The results indicated that the factor loadings were moderate to high at both individual and group levels. The standard errors were low, suggesting robust model estimation. The goodness of fit of the

Table 1
Intercorrelations Among Variables and Group-Level Descriptive Data at Times 1 and 2

	1	2	3	4	5	6	7	8	9
Time 1									
1. Positive sociometric nominations									
2. Negative sociometric nominations	-.10**								
3. Leadership	.26***	-.04							
4. Peer-assessed sociability	.37***	-.04	.61***						
5. Peer-assessed aggression	-.06	.72***	-.08*	.00					
6. Teacher-rated competence	.29***	-.24***	.53***	.49***	-.25***				
7. Teacher-rated acting out	-.16***	.30***	-.28**	-.14**	.45***	-.35***			
8. Teacher-rated learning problems	-.27***	.25***	-.53***	-.39***	.28***	-.57***	.51***		
9. Academic achievement	.21***	-.24***	.41***	.33***	-.22***	.43***	-.20***	-.67***	
Group-level descriptive data									
Minimum	-1.12	-0.63	-0.79	-0.86	-0.69	-3.08	-1.85	-1.24	-2.28
Maximum	1.40	5.85	2.14	2.31	5.91	1.99	4.10	1.92	1.60
M	-0.09	0.08	-0.02	-0.06	0.04	-0.10	0.00	0.02	0.23
SD	0.59	0.89	0.67	0.56	0.86	0.77	0.78	0.65	0.79
Time 2									
1. Positive sociometric nominations									
2. Negative sociometric nominations	-.18***								
3. Leadership	.13**	-.17***							
4. Peer-assessed sociability	.37***	-.09*	.39***						
5. Peer-assessed aggression	-.08*	.59***	-.06	.04					
6. Teacher-rated competence	.21***	-.21***	.48***	.48***	-.19***				
7. Teacher-rated acting out	-.08*	.32***	-.18***	-.08*	.48***	-.34***			
8. Teacher-rated learning problems	-.18***	.26***	-.35***	-.22***	.23***	-.39***	.57***		
9. Academic achievement	.20***	-.27***	.39***	.29***	-.12**	.37***	-.20***	-.60***	
Group-level descriptive data									
Minimum	-1.10	-0.74	-0.50	-0.87	-0.61	-1.69	-1.40	-1.28	-2.63
Maximum	1.73	3.70	2.91	4.54	4.04	2.56	3.63	2.09	1.20
M	-0.07	0.02	0.00	0.05	0.01	-0.05	-0.02	0.02	-0.02
SD	0.55	0.70	0.73	0.81	0.70	0.71	0.63	0.61	0.68

Note. The variables were standardized within class.
p* < .05. *p* < .01. ****p* < .001.

measurement model was satisfactory, $\chi^2 = 872.66$, $df = 499$, $\chi^2/df = 1.75$; comparative fit index (CFI) = 0.97; Tucker–Lewis Index (TLI) = 0.96; root mean square error of approximation (RMSEA) = 0.04. Correlations among latent variables at Times 1 and 2 are presented in Table 2. The results indicated that academic performance and social competence were positively predictive of each other over time and that academic performance and social problems were negatively predictive of each other over time.

Structural Relations Between Time 1 Academic Performance and Time 2 Social Functioning

Next, we conducted ML-SEM (Múthen & Múthen, 2003) to examine the main and moderating effects of group academic performance and social functioning. The analyses of the group main effects tested our hypotheses that the peer group would have direct

contributions to social and academic development. The analyses of the moderating effects tested the hypotheses that group academic and social contexts would facilitate or constrain the predictive individual-level relations between academic achievement

Table 2
Correlations Among Latent Variables at Times 1 and 2

	1	2	3	4	5
Time 1					
1. Social competence					
2. Social problems	-.29***				
3. Academic performance	.58***	-.45***			
Time 2					
4. Social competence	.70***	-.22***	.40***		
5. Social problems	-.23***	.78***	-.30***	-.22***	
6. Academic performance	.42***	-.29***	.69***	.41***	-.34***

****p* < .001.

and social functioning. To present our results more clearly, we plotted regression slopes for groups with high (+1 *SD*) and low (−1 *SD*) scores on the group variable, when a significant interaction was found. The plotting approach is consistent with what is commonly used in ordinary least squares multiple regression. In the model estimation, both group- and individual-level variables were latent variables, each measured by multiple indicators. The measurement models and the structural relations among the latent variables were included in the analysis at the same time.

In the analyses of relations between Time 1 academic performance and Time 2 social variables, the Time 2 social competence or social problems was the latent criterion variable, the corresponding Time 1 variable was the latent control variable, and Time 1 academic performance was the latent predictor variable. The resulting Level 1 intercepts and slopes were treated as random rather than fixed, which were regressed on Time 1 group academic performance at Level 2 or the group level. The basic models are as follows:

$$\text{Level 1 : INSOC2} = \beta_{0j} + \beta_{1j}(\text{INACAD1}) \\ + \beta_{2j}(\text{INSOC1}) + r_{ij},$$

where INSOC2 and INSOC1 represent individual social variable at Times 2 and 1, respectively; INACAD1 represents individual academic variable at Time 1; β_{0j} is individual-level intercept; β_{1j} and β_{2j} are individual-level slopes; and r_{ij} is individual-level residual;

$$\text{Level 2 : } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{GRACAD1}) + u_{0j}, \\ \beta_{1j} = \gamma_{10} + \gamma_{11}(\text{GRACAD1}) + u_{1j}, \text{ and} \\ \beta_{2j} = \gamma_{20} + u_{2j},$$

where GRACAD1 represents group academic variable at Time 1; γ_{00} and γ_{01} are group-level coefficients (intercept and slope) in predicting β_{0j} ; γ_{10} and γ_{11} are group-level coefficients in predicting β_{1j} ; and γ_{20} is group-level coefficient in predicting β_{2j} . In these equations, u_{0j} , u_{1j} , and u_{2j} are the group-level residuals.

Substituting β_{0j} , β_{1j} , and β_{2j} in Level 1 equation with Level 2 models yields a combined model:

$$\text{INSOC2} = \gamma_{00} + \gamma_{01}(\text{GRACAD1}) + \gamma_{10}(\text{INACAD1}) \\ + \gamma_{11}(\text{GRACAD1}) \times (\text{INACAD1}) \\ + \gamma_{20}(\text{INSOC1}) + u_{1j}(\text{INACAD1}) \\ + u_{2j}(\text{INSOC1}) + u_{0j} + r_{ij}.$$

In this equation, γ_{01} indicates the *main effect* of Time 1 group academic variable on Time 2 social variable controlling for Time 1 social variable, whereas γ_{11} , the Group \times Individual cross-level interaction, indicates

the *moderating effect* of Time 1 group academic variable on the relation between Time 1 individual academic variable and Time 2 individual social variable. In addition, γ_{10} represented pooled or average within-group individual-level relations between Time 1 academic variable and Time 2 social variable, and γ_{20} represented the stability effect. The models tested in this study are illustrated in Figures 1–4. Of most interest in the study were the main and moderating effects of group academic performance, γ_{01} and γ_{11} . The same model was used in predicting social competence and social problems. The estimated effects are presented in Figures 1 and 2 (*SEs* are given in parentheses after the effects). Preliminary analyses indicated that grade affected the main effects of group social functioning, and thus grade was controlled at Level 2 in formal analyses. Although the multilevel results were obtained simultaneously in the same analysis, for the purpose of presentation, we report below individual-level results separately from group-level results.

Concerning the relations at the *within-group individual level*, as shown in Figures 1 and 2, Time 1 academic performance (γ_{10}) positively predicted Time 2 social competence, but not Time 2 social problems, over and above the significant stability effect (γ_{20}). Concerning the *group main effects* (γ_{01}), Time 1 group academic performance positively predicted Time 2 social competence and negatively predicted Time 2 social problems. The results supported our hypothesis about the main effects of group academic performance.

The *moderating effects* of Time 1 group academic performance on the longitudinal relations are indicated by γ_{11} in Figures 1 and 2. Group academic performance had a positive moderating effect on the longitudinal relation between Time 1 individual academic performance and Time 2 individual social competence. Group academic performance also had a positive moderating effect on the relation between Time 1 individual academic performance and Time 2 individual social problems.

The group academic moderating effects are illustrated in Figures 5 and 6, where the associations between Time 1 academic performance and Time 2 social variables at the individual level (simple slopes) were plotted at a high and low values (1 *SD* above and below the mean) of the group academic variable. The significance test of the difference between the simple slopes was equivalent to that of the corresponding moderating effect (Aiken & West, 1991). As indicated in Figure 5, Time 1 individual academic performance significantly and positively predicted Time 2 social competence in groups with high academic scores,

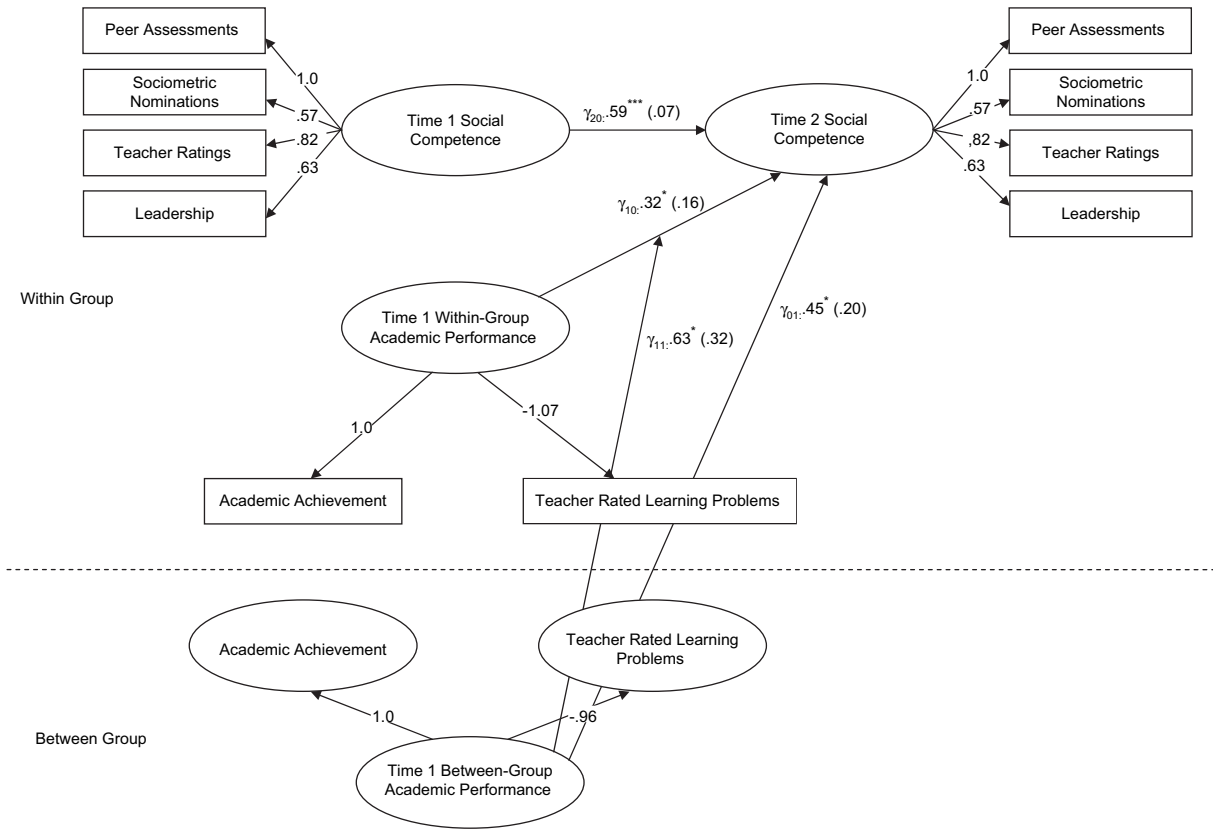


Figure 1. Effects in analysis of the relation between Time 1 academic performance and Time 2 social competence. Standard errors are given in parentheses after the effects. Grade was controlled at Level 2 in all analyses. * $p < .05$. *** $p < .001$.

effect = .98, $SE = 0.26$, $t = 3.76$, $p < .001$; the association was not significant in groups with low academic scores. As indicated in Figure 6, Time 1 individual academic performance significantly and negatively predicted social problems in groups with low academic scores, effect = $-.83$, $SE = 0.27$, $t = -3.07$, $p < .01$, but not in groups with high academic scores. The results supported our hypotheses that high-achieving groups would facilitate the positive effects of individual academic achievement on later social competence and that low-achieving groups would facilitate the negative effects of individual academic performance on later social problems.

Structural Relations Between Time 1 Social Functioning and Time 2 Academic Performance

Similar analyses were conducted to examine the relations between Time 1 social competence and social problems and Time 2 academic performance. The results concerning estimated effects are presented in Figures 3 and 4. The results indicated that, control-

ling for Time 1 academic performance (stability), Time 1 social competence and social problems nonsignificantly predicted later academic performance. Moreover, inconsistent with our hypotheses, the main effects of group social variables on later individual academic performance and moderating effects of group social variables on the longitudinal relations were nonsignificant.

Gender and Grade Effects

We examined the effects of gender (coded as 0 for female and 1 for male) and grade (coded as 0 for Grade 3 and 1 for Grades 6) and the interaction terms of Gender/Grade \times Time 1 group variables as Level 2 predictors (gender and grade were not included in Level 1 analyses because of the lack of within-group variability). Mixed-gender groups were not included in the analyses. No significant effects were found for either gender or grade. The results suggested that the group effects were consistent across gender and grade.

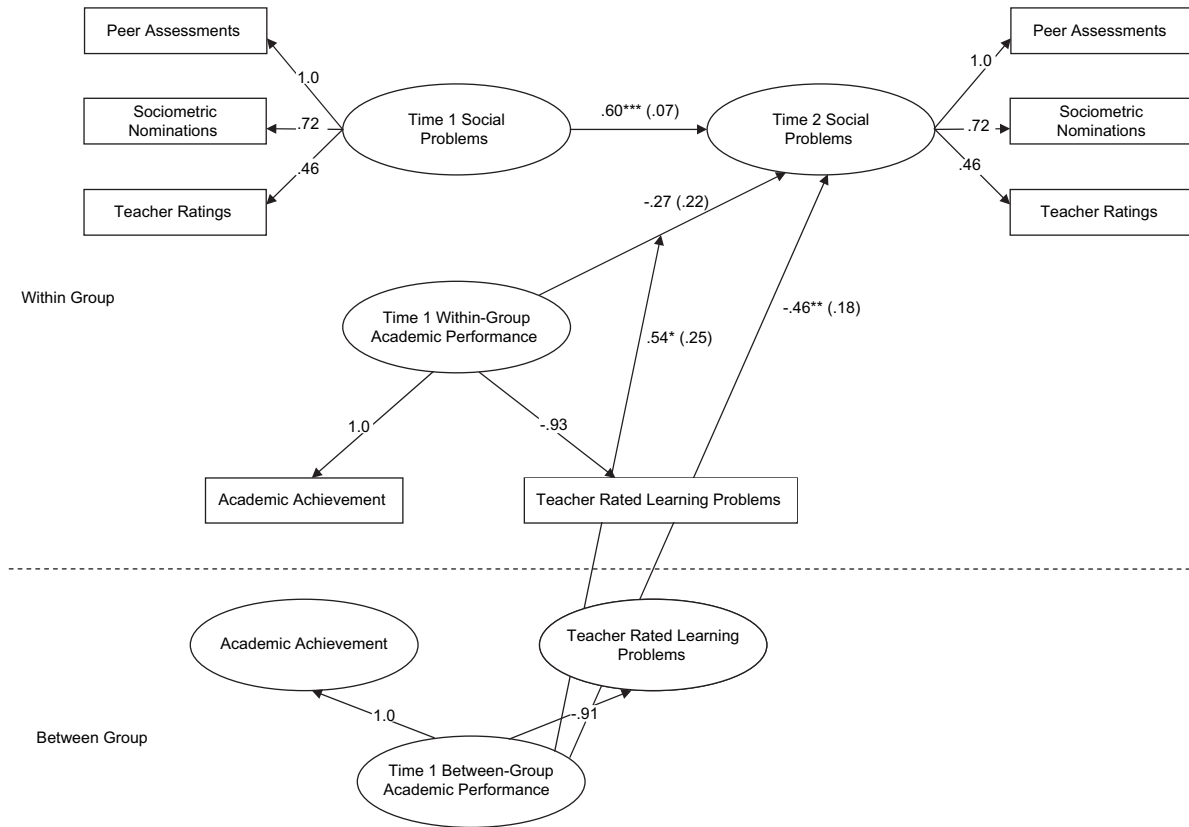


Figure 2. Effects in analysis of the relation between Time 1 academic performance and Time 2 social problems. Standard errors are given in parentheses after the effects.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

It has been argued that the peer group may exert significant impact on children’s social interactions and adjustment outcomes (e.g., Brown & Klute, 2003). The significance of the peer group may be particularly evident in Chinese children because of the cultural emphasis on the value of peer relationships in helping children achieve social and school success (Luo, 1996; Sun, 1995). Despite these general arguments, however, the effects of peer group context on individual development have been inadequately examined, largely due to the methodological difficulties in analyzing the cross-level relations involving group and individual characteristics. As a recent advance in analytic methods, the multilevel approach provides a useful means for assessing hierarchically nested relations without involving the aggregation bias and the “unit of analysis” problems (Bryk & Raudenbush, 1992). In the present study, we applied that approach to explore the role of the peer group in individual social functioning and academic performance and their relations. The results indicate that group academic performance had significant main and moder-

ating effects on individual social development, which supported the argument concerning the socialization function of the peer group (Cairns & Cairns, 1994; Harris, 1995).

Group Main Effects on Social Functioning and Academic Performance

A major hypothesis in the study was that the peer group would make direct contributions to later academic performance and social functioning. This hypothesis was supported in part by the results. Although Time 1 group social functioning did not predict later individual academic performance, Time 1 group academic performance positively predicted later social competence and negatively predicted later social problems. The correlational analyses showed that social and academic variables were significantly correlated over time. The predictive correlations were maintained largely by the stability effects. Nevertheless, the main effects of group academic performance on later social competence and problems remained significant after the stability effect was controlled. The results suggest that, from a developmental

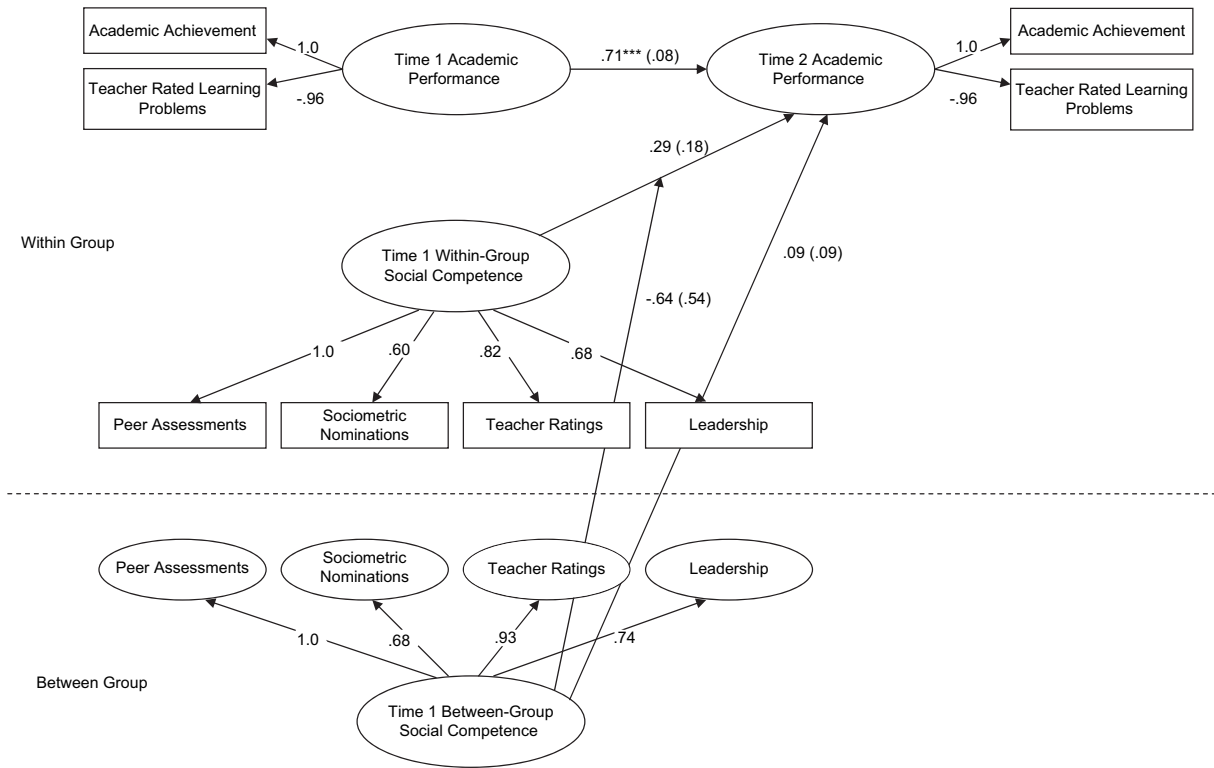


Figure 3. Effects in analysis of the relation between Time 1 social competence and Time 2 academic performance. Standard errors are given in parentheses after the effects. *** $p < .001$.

perspective, children in academically strong groups tend to become increasingly competent in social activities and display less antisocial and deviant behaviors, compared with their counterparts in academically poor groups. Thus, group academic context is important for children’s social development.

The group influence may occur through multiple processes. In addition to the common processes involved in peer relationships such as shared activities and mutual assistance in dyadic interactions, researchers are particularly interested in group-level processes such as norm-based regulation in group activities (Brown, 1990; Cairns & Cairns, 1994). For example, the goal of pursuing academic achievement in high-achieving groups requires group members to control disruptive behaviors and to display cooperative behaviors that are conducive to learning (Wentzel & Asher, 1995). Group academic activities may also help group members obtain positive social reputations and status in the class (Chen et al., 1997). In contrast, academically poor groups are likely to endorse negative attitudes and behaviors toward the school such as violation of school rules, which may in turn lead to difficulties in social adjustment.

Group Moderating Effects on Relations Between Individual Academic Achievement and Social Functioning

Our second main hypothesis was that in addition to its direct main effects, the initial group context would have moderating effects on the individual-level longitudinal relations between academic achievement and social functioning. Again, the results supported, in part, our hypothesis. Specifically, group academic performance, but not group social functioning, had significant moderating effects on individual-level relations. Further slope analyses revealed that individual academic performance significantly and positively predicted later social competence in high-achieving groups but not in low-achieving groups. The high-achieving group context appeared to enhance the relevance of individual academic performance to the development of social competence. These results supported the “resource-potentiating” model (Kupersmidt et al., 1995) because group academic performance affected later social competence mainly among academically competent children (as indicated by the larger difference between high- and low-achieving groups in Figure 5). Within high-achieving groups that focus

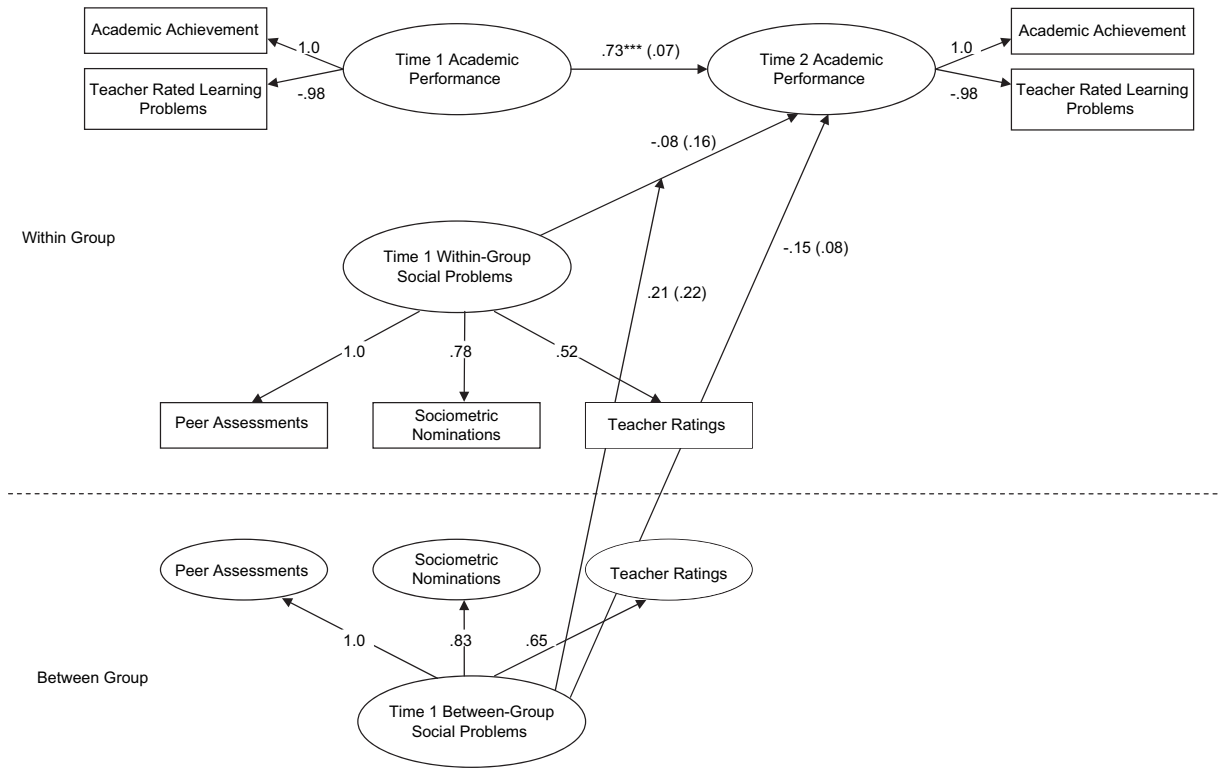


Figure 4. Effects in analysis of the relation between Time 1 social problems and Time 2 academic performance. Standard errors are given in parentheses after the effects. *** $p < .001$.

on academic work as a major norm for group organization, members who have relatively higher academic standings may receive more social and emotional support and obtain higher recognition from peers, which are conducive to the acquisition of skills and confidence in their social interactions (Rubin et al., 2006). Members with relatively lower achievement within these groups, however, may not benefit as much

in social interactions. The group moderating effect was indicated by the improvement of academically competent children in social adjustment only in high-achieving groups, not in low-achieving groups. Academically competent children in low-achieving groups may not receive social support and thus do not have evident advantages in interactions when academic achievement is not appreciated or valued in the group.

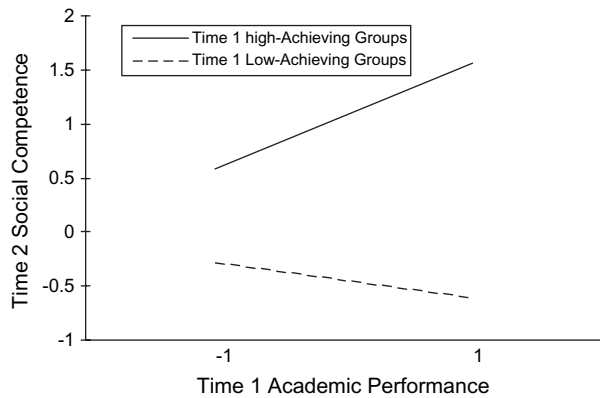


Figure 5. Moderating effects of Time 1 group academic context on individual-level relations between Time 1 academic performance and Time 2 social competence.

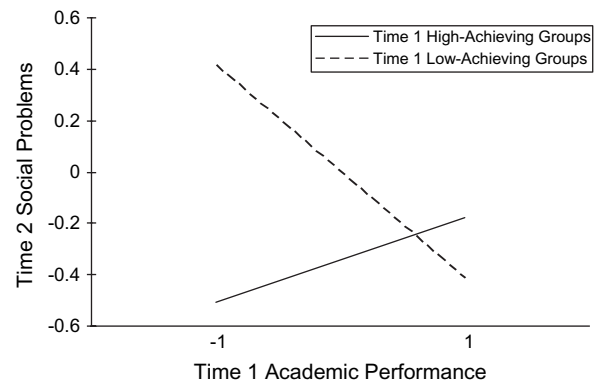


Figure 6. Moderating effects of Time 1 group academic context on individual-level relations between Time 1 academic performance and Time 2 social problem.

Group academic performance also had a moderating effect on the negative relation between individual academic performance and later social problems; the relation was more evident in low-achieving groups. These results support the "stress-buffering" model (Cohen & Wills, 1985) because group academic performance mainly affected academically poor children (Figure 6). Compared with their counterparts in other groups, children who had academic difficulties and were affiliated with academically poor groups were more likely to display social problems. The low-achieving groups appear to exacerbate social and behavioral problems of academically poor children and place them at heightened risk for maladaptive social development (Cairns & Cairns, 1994; Dishion et al., 1999). High-achieving groups, however, serve a buffering function that protects academically weak children from developing social problems. As a result, academically weak children in high-achieving groups develop fewer social problems than their counterparts in low-achieving groups.

The results concerning the resource-potentiating effects of group academic performance in predicting social competence and the stress-buffering effects in predicting social problems suggest that the moderating effects of peer group academic context on individual development may be domain specific, depending on the nature of the outcome. For children with academic difficulties in China, a major challenge in social adjustment is the experience of negative social evaluations including peer rejection in the school (Chen et al., 1997). Thus, the significance of high-achieving peer groups is likely manifested in their buffering effects on the development of social problems. On the other hand, given the social approval of academic achievement in Chinese schools, academically competent children may not face particular social problems. Instead, they are expected to develop advanced and comprehensive social skills compatible with their academic abilities (Luo, 1996). High-achieving peer groups may serve as a "potentiator" promoting the social competence of academically competent children. The domain-specific nature of peer group effects is another important message from the present study.

In contrast to group academic performance, initial group social functioning did not have significant moderating effects on the individual-level relations. Two explanations may be offered. First, whereas Chinese schools highly emphasize academic achievement, there are no clear guidelines for the development of social competence. For example, assertive social skills such as active social participation and self-direction have been traditionally neglected in

Chinese culture (e.g., Yang, 1986). These social skills have become increasingly important in recent years. Nevertheless, the understanding of, and attitudes toward, children's social competence in the school is inconsistent (Xu & Peng, 2001), which may undermine the impact of social norms on group organization and individual behavior. Second, the lack of significant moderating effects of group social functioning may be due to the robustness of academic achievement during development. This argument is consistent with the results that academic performance was highly stable over time at the within-group individual level. Therefore, group social context did not lead to developmental changes in the internal structure or the relative standing of children in academic performance within the group.

Gender and Grade Differences

No significant gender differences in peer groups and their effects were found in the present study. The results were consistent with the findings of previous studies using similar methods in Western and Chinese children (e.g., Cairns et al., 1995; Leung, 1996). Boys and girls appear to establish similar group affiliations in schools. Moreover, peer groups may serve similar functions in social and academic development for boys and girls. Nevertheless, given the argument that boys and girls may engage in different types of peer activities (Benenson, Apostoleris, & Parnass, 1997; Maccoby, 1995), the issue of gender differences needs to be investigated further in the future.

The results concerning the lack of significant grade effects also need to be replicated in future research. It has been argued that children often form relatively small and emotionally intensive cliques in childhood, which are likely to place substantial constraint on individual behaviors (Brown, 1990). With age, however, children may establish increasingly extensive, and different types of, peer relationships and attempt to learn diverse values in the peer context (Rubin et al., 2006). The present study focused mainly on peer groups in childhood. It will be important to investigate the significance of peer groups for the development of social competence and school achievement in broader age ranges including adolescence.

Conclusions, Limitations, and Future Directions

The results of the present study indicate that group academic performance contributes to individual social development. The results also indicate that group academic context may moderate the relations

between individual academic performance and later social functioning. As mentioned earlier, researchers have examined the relations between academic achievement and social competence (e.g., Chen et al., 1997; Welsh et al., 2001). However, little is known about the social-contextual factors involved in the relations. Although researchers have studied how the peer group affects individual behaviors as a main effect (e.g., Espelage et al., 2003), no research has been conducted to examine the moderating effects of the group on the relations between academic performance and social functioning from a developmental perspective. Therefore, the results of the present study represent an important contribution to the literature.

Researchers have studied the concurrent effects of the peer group on children's social and school adjustment (e.g., Chen et al., 2003). The present study focused on the effects of peer group experiences on later social functioning and academic achievement without examining concurrent group effects. It will be interesting in the future to explore how proximal and prior peer group experiences contribute jointly and interactively to developmental outcomes.

The present study was conducted in Chinese children. We used the Western literature as a background for the discussion of the peer group (e.g., Cairns & Cairns, 1994). In general, the results meshed well with this literature. Some specific cultural features, such as an emphasis on the socialization function of peer relationships and high values on academic achievement, however, should be noted for the understanding of the results. It has been argued that Chinese culture tends to emphasize the instrumental, rather than expressive or emotional, facets of social relationships (Smart, 1999). The quality of peer relationships including peer groups is appraised mainly in terms of whether peer activities help children learn social standards (Sun, 1995). The significant peer group effects found in the study may be, in part, due to the emphasis on the "instrumental" aspect of the peer group. More specifically, the relatively stronger effects of group academic context may be related to the emphasis of academic achievement in Chinese societies (Stevenson et al., 1990). The general cultural values are likely to be reflected in group activities, which in turn may promote the effects of group academic norms on the development of social functioning. It will be interesting to investigate whether the results can be generalized to other cultures where academic achievement is not as highly emphasized as in China.

Finally, children's peer groups operate in larger social contexts. This may be especially the case in

China, where adults are encouraged to be involved in children's social interactions and relationships (Chen et al., 1995). Thus, it will be important to examine how other social contexts in the school such as teacher-student interactions may affect children's peer group organization. Despite the weaknesses and limitations, the present study provided valuable information about the contextual nature of the peer group and its regulatory function in child development.

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