Aggression, peer relationships, and depression in Chinese children: a multiwave longitudinal study

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Background: Largely due to methodological problems in existing studies, issues concerning causal directions and confounding factors, such as the stability effect, remain to be clarified in the relations among aggression, peer relationships, and psychological adjustment. The purpose of this longitudinal study was to examine (a) reciprocal direct and indirect effects among aggression, peer relationships, and depression based on a full cross-lagged model with the stability effect controlled, and (b) moderating effects of initial status on the growth of the variables. **Method:** A sample of Chinese children ($N = 1,162$) participated in the study. Four waves of longitudinal panel data were collected from the participants in ages 9–12 years from multiple sources including peer assessments, teacher ratings, sociometric nominations, and self-reports. **Results:** Aggression negatively contributed, in both direct and indirect manners, to later peer relationships, and positively contributed to depression in late childhood. Peer relationships had negative direct and indirect effects on later aggression and depression. In addition, the initial level of aggression moderated the growth pattern of peer relationships. **Conclusions:** Early social and behavioral problems have proximal as well as long-term cross-domain effects on individual development. Moreover, children's early behavioral characteristics may serve to facilitate the development of social competence and exacerbate the development of social problems. The study provided valuable information about how the important aspects of socioemotional functioning were associated with each other in Chinese children from a developmental perspective. **Keywords:** Aggression, peer relationships, depression, Chinese children.

Introduction

Aggression is a salient issue from early childhood because it may inflict harm on others and threaten group functioning. Moreover, aggressive behavior is highly stable over time and often unreceptive to educational efforts and other external influences (e.g. Dodge, Coie, & Lynam, 2006; Trembaly, 2011). Researchers in the field of peer relationships have been interested in how children's aggressive behavior affects peer acceptance and friendship (Rubin, Bukowski, & Parker, 2006). Findings from various research programs have demonstrated that children who display aggressive and disruptive behaviors are likely to be rejected by peers and experience difficulties in establishing close dyadic relationships with others (e.g. Coie, Terry, Lenox, Lochman, & Hyman, 1995; Rubin et al., 2006).

Peer relationships, on the other hand, are an important social context for individual adaptive and maladaptive development (Rubin et al., 2006). For example, peer relationships are often considered a major source of emotional support that is associated with a sense of security and belongingness. Children who are rejected or isolated by peers may feel frustrated and distressed and develop negative attitudes and feelings about others and self. Although incon-

sistent results have been reported, a number of studies have shown that peer relationships play a significant role in the development of psychological adjustment and problems such as depression (e.g. Fontaine et al., 2009).

There are several noticeable limitations in the research on relations among aggression, peer relationships, and psychological adjustment. First, most of the studies have been cross-sectional, and thus provide little information about causal directions. The existing longitudinal studies have been based mainly on assessments at two-time points, with social behavior, such as aggression predicting later peer relationships or with peer relationships predicting later adjustment variables. With a few exceptions (e.g. Coie et al., 1995), these studies did not control for stability effects and concurrent links among the variables, which may at least partly explain the predictive relations. Second, influences among aspects of socioemotional functioning are likely a continuous, long-term process, varying across different developmental periods. Two waves of data are highly limited in revealing developmental patterns. Third, the influences may occur in direct as well as indirect manners. Researchers have often focused on one-to-one relations with little attention to indirect or mediational effects involved in the relations. Finally, research in this area has been conducted mostly in Western, especially North

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Conflict of interest statement: No conflicts declared.

American, children and adolescents. Consequently, our understanding of the major aspects of socio-emotional functioning has been restricted largely to Western contexts.

To fill the gaps in the literature, we conducted this study to examine how aggression, peer relationships, and depression contributed to each other across 4 years in a sample of Chinese elementary school children. Panel data were collected in each of ages 9–12 years. We tested reciprocal direct and indirect effects among the variables based on the full cross-lagged model over and above the stability effects.

Aggression, peer relationships, and depression in Chinese children

Maintaining social harmony and positive interpersonal relationships is a primary concern in both traditional and contemporary Chinese societies. Individual behaviors that threaten the well-being of others and the group, such as aggression, are strictly prohibited. During socialization, children are taught to control their frustration, anger, and impulsive and defiant behaviors from the early years (Chen, 2010).

In contrast to aggression, individual socioemotional problems of an internalized nature have traditionally been neglected in Chinese society. The display of individual negative feelings is considered socially inappropriate and shameful to self and family and often treated as medical or political-ideological problems (Chen, 2010). Nevertheless, it has been found that children and adolescents in China experience an equal, or even higher, level of affect disturbances compared with their North American counterparts (e.g. Chen, Rubin, & Li, 1995). An investigation of social and personal factors that predict depression would help understand the development of psychological problems in Chinese children.

Relations among aggression, peer relationships, and depression in Chinese children: the present study

In the present study, we were interested in (a) mutual and unique contributions of aggression, peer relationships (indexed by peer preference–likeability and friendship), and depression over and above the stability effects at different ages, (b) indirect effects among the variables over multiple time lags, and (c) the moderating effects of the child's initial status on the growth of these variables. Although we examined the full cross-lagged relations, we believed that how aggression, peer relationships, and depression contributed to each other might be domain specific. The dispositional nature of aggressive behavior (e.g. Dodge et al., 2006), for example, suggests that this behavior may be less susceptible than social and psychological adjustment to the influence of other factors. Aggressive behavior may also be established earlier than peer relationships and depression

(e.g. Trembaly, 2011). Thus, it seems reasonable to expect that the contributions of aggression to later peer relationships and depression are more evident than those of peer relationships and depression to the development of aggression. Given the literature on the role of social relationships in psychological adjustment (e.g. Fontaine et al., 2009), it also seems conceivable that the contributions of peer relationships to depression are more evident than those of depression to peer relationships.

Mixed results have been reported in Western societies concerning the relations between aggression and depression; aggressive children have been found to report more internalizing problems including depression than others in some studies (e.g. Holt & Espelage, 2007) but not in others (e.g. Mercer & DeRosier, 2008). It has been argued that some aggressive children may develop biased self-perceptions or obtain social support from similarly deviant peers (e.g. Dodge et al., 2006), which may reduce negative self-feelings, such as depression. In Chinese schools, students are required to engage in regular public evaluations, in which students evaluate themselves and receive peer and teacher feedback in terms of whether their behavior and performance reach school standards. The unfavorable social feedback that aggressive children receive in the public evaluation process may facilitate the development of negative self-schemata, which in turn may lead to depression. Thus, we expected in this study that aggression would contribute to increased risk for later depression in Chinese children.

According to the developmental cascade perspective (e.g. Masten & Cicchetti, 2010), the effects of early behaviors or problems may spread to other domains progressively over time. The cascade processes include direct and synchronized influences across different domains and the carry over or continuation of the influences during development. Thus, in addition to their direct cross-lagged effects, we expected that aggression, peer relationships, and depression would indirectly contribute to developmental outcomes over multiple time lags through the mediation of concurrent and predictive relations and stability effects.

Finally, we examined the general developmental patterns of aggression, peer relationships, and depression in the study. There are substantial individual variations in how individuals develop over time. From childhood to adolescence, for example, some children gradually improve their social status in the peer group, others maintain their status at a similar level, and still others become increasingly isolated from peers and experience heightened difficulties in social relationships. One of the factors that determine, in part, the developmental pattern may be children's social-behavioral characteristics. It is possible that peer relationships become more extensive and desirable for children who display few behavioral problems. In contrast, peer relationships

may gradually deteriorate for children who display aggressive behavior in social interactions. Similarly, children who are rejected by peers or lack intimate relationships may become increasingly depressed in the later years. However, positive peer relationships may hinder the development of depression; thus, children who are accepted by others and have support from their friends may become less depressed over time.

The argument about the role of social-behavioral characteristics in shaping developmental patterns is consistent with the moderation models in the literature. According to the stress model (Cohen & Wills, 1985), negative personal or social conditions may function as an exacerbating factor, which makes children particularly vulnerable to risks and develop increased problems in the later years. In contrast, positive conditions are a protective factor to reduce risks or buffer against their effects, and thus protect children from developing further problems. From a different perspective, the resource-potentiating model (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995) indicates that positive conditions may serve to potentiate personal capacities or social resources and enhance adaptive development, whereas adverse conditions may suppress or inhibit positive development. In this study, we tested the models in a growth modeling framework. Statistically, the stress model could be supported if a significant positive growth (i.e. increase with time) of problems (e.g. depression) or negative growth of competence (e.g. peer relationships) is associated with initial undesirable conditions (e.g. high aggression). In contrast, the resource-potentiating model could be supported if a significant positive growth of competence or negative growth of problems is associated with initial desirable conditions (e.g. low aggression).

Method
Participants

The original sample consisted of 1162 third-grade children (580 boys and 582 girls) in nine elementary schools in Beijing, P. R. China. The schools were randomly selected from the ordinary public schools in the city. Unlike a small number of 'key' schools in the city in which students were selected from different areas on the basis of their school performance, students in ordinary schools came from the residential areas in which the school was located. There were 30 classes, with approximately 40 students in each class. The mean age of children was 9 years, 2 months. The structure and organization of elementary schools were similar and the core curriculum was stipulated by the Ministry of Education in China. The students were mostly from families with a low to middle socioeconomic status. In the families, 37% of mothers and 36% of fathers had an educational level of high school or below high school and they were largely nonprofessional workers, such as bus drivers and salesperson; the

others had educational levels ranging from vocational school and college to university graduate and they were mostly teachers, doctors, engineers, or civil officials. Nonsignificant effects of the demographic variables were found in the study.

The follow-up data were collected each year in the same schools for Grades 4–6. From the original sample, 1041 or 90% participated in the follow-up studies, and a total of 265 additional students who did not participate initially participated in the follow-up studies. Nonsignificant differences were found on the variables and relations of interest between children who participated in all waves and those who did not. The data were collected near the end of the school year (May and June) each time.

Procedure

At each time, we group administered to the children a peer assessment measure of aggression and a sociometric nomination measure. Children also completed self-report measures of friendship and depression. In addition, teachers were requested to complete a rating scale for each participant concerning his or her aggressive behavior. Our research team carefully examined the items in the measures, using a variety of formal and informal strategies (e.g. repeated discussion in the research group, interviews with children and teachers, psychometric analysis). All the measures had been used and proved to be reliable, valid, and appropriate in Chinese children in previous studies (e.g. Chen et al., 1995; Chen, Cen, Li, & He, 2005). The study was approved by the institutional review board. Written consent was obtained from all children and their parents through the school. The participation rate was approximately 95% at each time.

Measures

Peer assessments of aggression. We administered to the children a peer assessment measure of aggression, adopted from *The Revised Class Play* (*RCP*, Masten, Morison, & Pellegrini, 1985). During administration, the research assistant read each of the seven behavioral descriptors, and children were asked 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. Subsequently, nominations received from all classmates were used to compute each item score for each child. The item scores were standardized within the class at each wave to adjust for differences in the number of nominators. Items in the measure were concerned with overt physical and verbal aggressive behaviors (e.g. 'gets into a lot of fights', 'picks on other kids'). Factor analysis indicated that the items represented the corresponding factor (also see Chen et al., 2005). Internal reliabilities were .91–.93 in Grades 3–6 in this study.

Teacher ratings. The head teacher in each class was asked to complete a six-item aggression–acting-out scale [e.g. 'overly aggressive to peers (fights)', 'disruptive in class'], adapted from the teacher–child rating scale (T–CRS; Hightower et al., 1986), for each participant in his or her class. The head teacher in Chinese schools

often teaches a major course and takes care of the social and daily activities of the class. Teachers rated, on a 5-point scale, how well each of the items described the child. The total scores were standardized within the class to allow for appropriate comparisons. Internal reliabilities were .81–.83 in this study.

Sociometric nominations. Each child was asked to nominate up to three classmates with whom he or she most liked to be, and three classmates with whom he–she least liked to be (positive and negative nominations). As suggested by other researchers (e.g. Coie et al., 1995), both same-sex and cross-sex nominations were allowed. The nominations received from all classmates were totaled and then standardized within each class to permit appropriate comparisons. Following Coie et al. (1995), an index of social preference, which indicates likeability of the child in the class, was formed by subtracting negative nomination scores from positive nomination scores.

Friendship. Each child was asked to identify up to three best friends in the class. Children were considered to have a mutual friendship if any of their choices reciprocally nominated them as one of their best friends, as suggested by other researchers (e.g. Hartup, 1996). The presence and absence of mutual friendship were scored 1 and 0, respectively.

Depression. Children's depression was measured by administering a Chinese measure, adapted from the *Children's Depression Inventory* (CDI; Kovacs, 1992). The Chinese measure included all 10 items in the short version (CDI-S) and 4 additional items from the full version which were considered useful by the research team in assessing Chinese children's depressed mood (the 14-item version was highly correlated with the full version in several large samples in China, with rs = .95–.96, ps < .001). Each of the items provides three alternative responses (e.g. "I feel like crying every day", "I feel like crying most days", "I feel like crying once in a while") from which the participant chooses one that best describes him or her in the past 2 weeks. The items center on a given thought, feeling, or behavior associated with depression, such as self-deprecation, reduced social interest, anhedonia, fatigue, and self-blame. Following the procedure outlined by Kovacs (1992), a total score of depression was computed by summing all item scores, with higher scores indicative of greater depression. Internal consistencies of this measure were .81–.84 in this study.

Results

We used Full Information Maximum Likelihood (FIML; Muthen & Muthen, 1998-2007) to estimate missing data for those who did not participate in all four waves of data collection. Then, following the literature (Bandalos & Finney, 2001), we used item parcels to form multiple indicators of each latent construct. The two indicators of the aggression construct were aggression–acting-out scores based on peer and teacher assessments. Peer relationship variable was extracted from two indicators, peer

preference and mutual friendship. Child depression was indicated by three indicators that were parceled from the depression items. Measurement models with the three constructs were evaluated at each time point and across four time points. Good model fits were obtained. The overall measurement model with four time points showed high to moderate factor loadings, ranging from .58 to .95. The standard errors were low (below .03), suggesting robust model estimation. The goodness of fit measures were satisfactory, χ^2 (92) = 194.64; χ^2/df = 2.12; CFI = .97; TLI = .99; RMSEA = .028, and WRMR = .078.

Gender differences

A multivariate analysis of variance (*MANOVA*) revealed a significant main effect of gender on the latent variables, $F(12, 1477)$ = 23.40, p < .001, partial η^2 = .16. Follow-up univariate analyses indicated that boys had higher scores on aggression (M = .23 to .25 for boys and −.26 to −.28 for girls) and lower scores on peer relationships (M = −.14 to −.18 for boys and .14 to .19 for girls), partial η^2 = .18 and .04, ps < .001, respectively. In addition, boys had higher scores on depression than girls (M = .06 to .11 for boys and −.04 to −.09 for girls), partial η^2 = .02, p < .01, in Grades 3–6.

Relations among aggression, peer relationships, and depression

We conducted structural equation modeling analyses using estimator of robust weighted least squares in Mplus 5.0 (*WLSMV*; Muthen and Muthen, 1998–2007) to test all the models. The residuals of the latent variables at the same time point were correlated, and the residuals of the same variable across different time points were also allowed to correlate, as suggested by other authors (e.g. Marsh & Hau, 1996). We first tested a base-line stability model to estimate stability coefficients which were correlations of the same variables over time (Figure 1). Stability coefficients were high and were all statistically significant. We then tested a full model to estimate all of the cross-lagged paths from one grade to the next among aggression, peer relationships, and depression. As we used *WLSMV* estimator for the estimation, Satorra-Bentler scaled difference chi-square test in Mplus with adjusted *df* was conducted to compare the baseline and full models (Muthen and Muthen, 1998–2007). The chi-square difference was significant, $\Delta\chi^2(9)$ = 55.38, p < .001, but other fit indexes were similar, CFI = .95 and .97, TLI = .98 and .99, RMSEA = .036 and .028, WRMR = 1.045 and .822, for the two models, respectively. The results suggest the adequacy of the full model. The full model with significant paths (solid lines) and nonsignificant paths (dashed lines) is shown in Figure 2. Aggression in Grades 3, 4, and 5 had significant negative direct effects on peer relationships in the
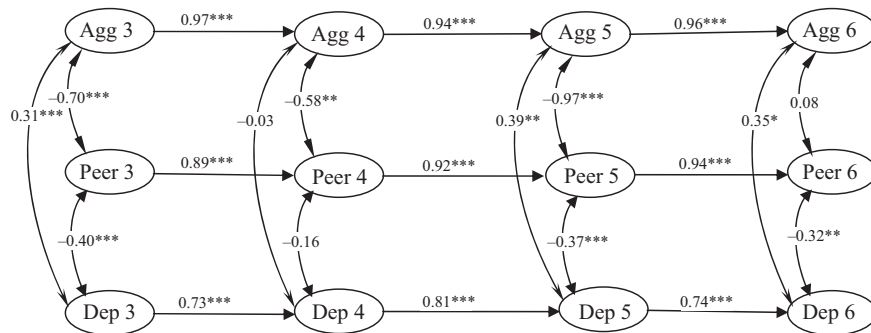
Figure 1 Estimates based on the stability model (Agg, aggression; Peer, peer relationships; Dep, depression. The number after the variable indicates Grade: Grades 3–6 are equivalent to ages 9–12 years)
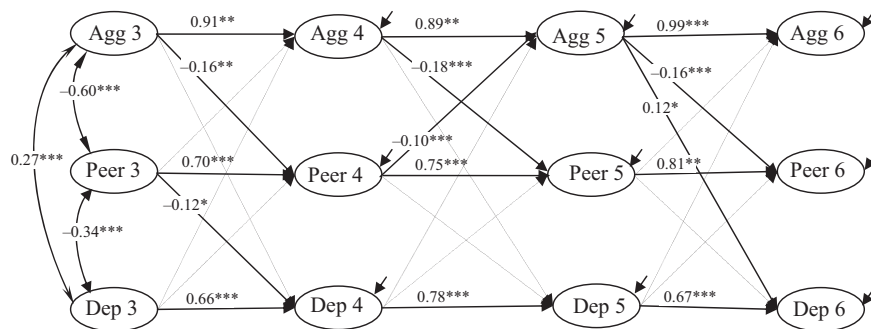
Figure 2 Estimates based on the full model with significant paths (solid lines) and nonsignificant paths (dashed lines, effects ranging from −.07 to −.04, $p > .05$; Residuals of within-time latent variables correlated)

following year. Aggression in Grade 5 had a significant positive effect on depression in Grade 6. Peer relationships in Grade 3 had a significant negative effect on depression in Grade 4. In addition, aggression and peer relationships had reciprocal time-lagged effects from Grade 4 to 5.

We examined indirect effects of aggression, peer relationships, and depression over multiple lags, based on the full model presented in Figure 2. The longer-lag indirect effects, calculated automatically using Mplus, were the sums of multiplicative products of regression coefficients representing intermediate cross-lagged effects and stability effects of the related variables. All the tests involving the mediation process were conducted with both direct and indirect effects in the same model. The longer-lag indirect effects are presented in Table 1. Aggression in Grades 3 and 4 had significant longer-lag indirect effects on later peer relationships. Aggression in Grade 4 also had a significant indirect effect on depression in Grade 6. Peer relationships in Grades 3 and 4 had a significant indirect effect on aggression in Grades 5 and 6, respectively. Peer relationships in Grade 3 had a significant indirect effect on depression in Grade 5 and 6. The longer-lag indirect effects of depression on peer relationships and aggression were not significant. Multigroup analyses were conducted to examine potential gender differences in the stabilities and the relations. No significant gender differences were found.

The effects of intercepts on slopes

We tested the moderating effects of the intercepts of aggression, peer relationships, and depression on their own and one another's slopes or growth coefficients using latent growth modeling (see the illustration of Figure 3 for the effects of intercepts on the slope of peer relationships). As shown in Table 2, the intercepts of aggression, peer relationships, and child depression were found to significantly moderate their own slopes. Specifically, there was a negative relation between the intercept and the growth slope (across 4 years) for the same variable, which suggested a 'regression-toward-the-mean' effect; children with higher initial scores had a negative growth, whereas children with lower initial scores had a positive growth in the same variable.

Across domains, the analysis revealed that the intercept of aggression had a significant moderating effect on the growth slope of peer relationships (Figure 3). Further simple slope analysis, using Aiken and West (1991) procedure, revealed that children with lower initial aggression (1 SD below the mean) had a positive growth in peer relationships, $\beta = .08$, $t = 7.59$, $p < .001$, whereas children with higher initial aggression (1 SD above the mean) had a negative growth in peer relationships, $\beta = -.08$, $t = -6.59$, $p < .001$, and children with average initial aggression had a nonsignificant growth in peer relationships. No significant gender differences were found in the effects of intercepts on slopes.

Table 1 Indirect effects of the variables over multiple lags

	Effect	SE	95% CI
Aggression 3 to peer relationships 5	−.29***	.05	(−.38, −.19)
Aggression 3 to peer relationships 6	−.37***	.04	(−.45, −.28)
Aggression 4 to peer relationships 6	−.29***	.04	(−.36, −.22)
Aggression 3 to depression 5	−.07	.05	(−.18, .04)
Aggression 3 to depression 6	.05	.05	(−.04, .14)
Aggression 4 to depression 6	.10*	.04	(.01, .18)
Peer Relationships 3 to aggression 5	−.08*	.04	(−.16, −.01)
Peer Relationships 3 to aggression 6	−.07	.04	(−.15, .00)
Peer Relationships 4 to aggression 6	−.08*	.03	(−.15, −.02)
Peer Relationships 3 to depression 5	−.11*	.05	(−.20, −.03)
Peer Relationships 3 to depression 6	−.09*	.04	(−.16, −.02)
Peer Relationships 4 to depression 6	−.03	.04	(−.10, .04)
Depression 3 to aggression 5	.04	.03	(−.01, .09)
Depression 3 to aggression 6	.04	.03	(−.02, .09)
Depression 4 to aggression 6	.01	.02	(−.04, .05)
Depression 3 to peer relationships 5	−.02	.03	(−.08, .04)
Depression 3 to peer relationships 6	−.02	.03	(−.07, .04)
Depression 4 to peer relationships 6	−.00	.03	(−.06, .05)

The number after the variable indicates Grade.
*$p < .05$, ***$p < .001$.
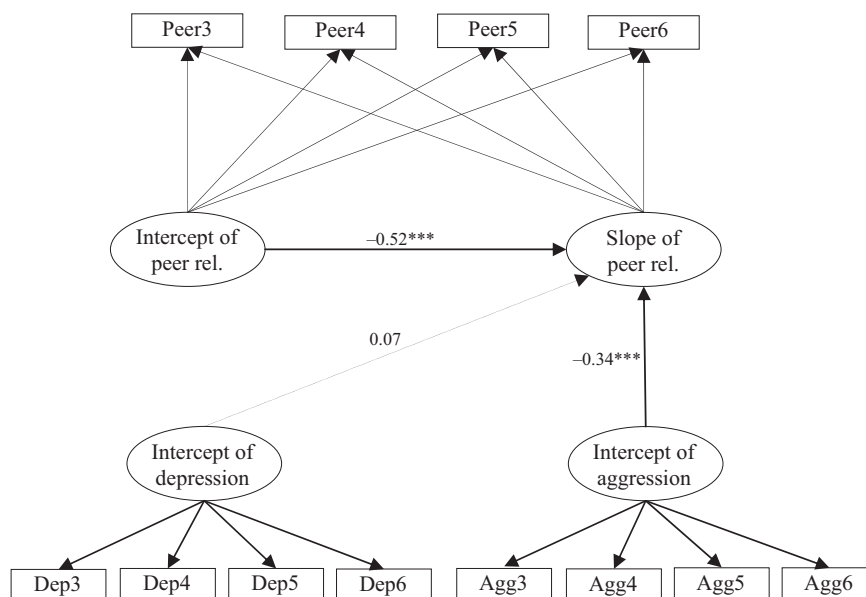
Figure 3 Moderating effects of intercept on the growth of peer relationships

Discussion

Social behaviors, peer relationships, and psychological adjustment represent important and inherently connected aspects of socioemotional functioning (Rubin et al., 2006). Largely due to methodological challenges, such as the requirements of multiwave longitudinal data, the relations among these aspects have not been adequately and systematically examined in empirical research from a developmental perspective. The longitudinal panel data in this study allowed us to analyze cross-lagged direct and indirect effects in the relations at different time points with the stability effect controlled. The results support the argument that early problems, such as aggression and peer isolation may have

proximal as well as long-term cross-domain effects on individual development (e.g. Masten & Cicchetti, 2010). The results also indicate that children's early social-behavioral conditions may serve to strengthen or facilitate the development of competence and exacerbate the development of problems ('the rich get richer and the poor get poorer' effect).

Direct and indirect contributions among aggression, peer relationships, and depression

The results first showed that aggression had direct effects on peer relationships in the following year as well as long-term indirect effects on peer relationships in the period of Grades 3–6. These results were

Table 2 Moderating effects of intercepts on slopes

Slope	Effect	SE	t-value
Depression			
Intercept of aggression	−.05	.08	−.61
Intercept of peer relationships	−.10	.07	−1.40
Intercept of depression	−.46	.06	−8.13***
Aggression			
Intercept of peer relationships	−.08	.10	−.87
Intercept of depression	.02	.07	.32
Intercept of aggression	−.23	.11	−2.16*
Peer relationships			
Intercept of aggression	−.34	.06	−5.55***
Intercept of depression	.07	.06	1.10
Intercept of peer relationships	−.52	.06	−8.01***

*$p < .05$, ***$p < .001$.

consistent with our hypothesis and the Western literature that aggression is generally associated with increased problems in overall peer acceptance or likeability and the formation of close dyadic relationships (e.g. Rubin et al., 2006), although aggressive children may have a high social status and be perceived as popular or 'cool' in certain peer groups and crowds (e.g. Cillessen & Rose, 2005). Unlike the consistent effects of aggression, most direct effects of peer relationships on later aggression were nonsignificant, except one from Grade 4 to 5. However, the direct effect of peer relationships in Grade 4 on aggression in Grade 5 was important; it linked the stability effects of peer relationships (e.g. from Grade 3 to 5) and aggression (e.g. from Grade 5 to 6) and constituted a crucial path for indirect contributions of peer relationships to aggression from Grade 3 to 5 and from Grade 4 to 6. As a result, the relations between aggression and peer relationships became bidirectional from a developmental perspective, although the effects of aggression were clearly predominant over those of peer relationships.

Aggression in Grade 5 had a positive direct effect on depression in Grade 6 and aggression in Grade 4 had a positive indirect effect on depression in Grade 6. Similar results have been found in some studies in Western societies (e.g. Holt & Espelage, 2007). Nevertheless, the effects of aggression on depression in Chinese children may need to be understood in the Chinese context. In Chinese schools, students engage in regular public evaluations in which children's behaviors and performance are evaluated collectively by peers, teachers, and themselves. This evaluation process, particularly the negative feedback that aggressive children receive from peers and teachers in the process, likely leads to negative self-feelings and depression. The significant effect of aggression on depression that occurred in late childhood suggested that with age, children increasingly understand the pervasive consequences of their behaviors. The awareness of social standards and concern about the discrepancy between their behaviors and these standards may result in self-blame, self-dissatisfaction, and eventually depressed feelings.

Peer relationships in Grade 3 had a significant and negative direct effect on depression in Grade 4 and indirect effects on depression in Grades 5 and 6. The results indicated that peer relationships in middle childhood might directly contribute to children's subsequent psychological well-being and, at the same time, have implications for relatively distal developmental outcomes. The results were consistent with the argument about the importance of peer relationships ('chumship') in middle childhood for later psychological adjustment (e.g. Rubin et al., 2006). Helping children develop positive peer relationships in the early school years may be an effective strategy to promote their adaptive psychological development. The lack of significant effects of peer relationships in high grades on depression may be related to the fact that with age children establish more extensive social networks including those outside the school. Consequently, peer relationships in school context may become less influential in determining individual psychological adjustment.

There were no significant direct or indirect effects of depression on later aggression or peer relationships, which was largely consistent with our expectations. The results suggest that children's social and behavioral characteristics are relatively robust and insusceptible to the influence of personal internal conditions. It is also possible that because children's depression and other internalizing problems are often neglected in Chinese society (e.g. Chen, 2010), they may not elicit evident adverse social reactions and corresponding behavioral changes. It will be interesting to examine this issue in other societies.

The moderating effects of initial status on the growth of aggression, peer relationships, and depression

Our analysis of growth patterns indicated that children's initial status (i.e. intercept) of aggression, peer relationships, or depression moderated its own growth slope. The results largely reflected the phenomenon of the 'regression-toward-the mean' over time – social and psychological characteristics or problems tend to decline for children with initial high scores and rise for children with initial low scores on the characteristics or problems.

More interestingly, we found that across domains, the intercept of aggression moderated the growth slope of peer relationships. The results suggested that initial behavioral problems predicted not only peer relationships at a specific time but also their general developmental trend from childhood to early adolescence. These results appeared to support both the resource-potentiating model and the stress model (Kupersmidt et al., 1995; Cohen & Wills, 1985). The contribution of initial low aggression to positive growth of peer relationships indicates that relatively desirable personal conditions may serve to

enhance adaptive social development. In contrast, the contribution of initial high aggression to negative growth of peer relationships indicates that adverse behavioral characteristics serve to exacerbate the development of social isolation, and thus make the children at risk for heightened social problems in the later years.

Limitations and future directions

There were several weaknesses and limitations in this study. First, the study was concerned with the relations among aggression, peer relationships, and depression from middle childhood to early adolescence. One needs to be careful in generalizing the results to other developmental periods. Second, we found that boys had more behavioral problems and poorer peer relationships than girls, which is consistent with those found in previous studies (e.g. Chen et al., 2005; Dodge et al., 2006). The higher depression of boys, although different from the Western literature (e.g. Kovacs, 1992), is also consistent with previous findings in China (e.g. Chen et al., 1995). Interestingly, no gender differences were found in the *relations* among aggression, peer relationships, and depression, suggesting that the results concerning the relations were consistent for boys and girls. Nevertheless, given the literature on gender-specific meanings of social behaviors and relationships (e.g. Rubin et al., 2006), this issue needs to be examined further in future research, and

conclusions should be made with caution before our results are replicated.

Finally, the influence of different aspects of socioemotional functioning on one another occurs in larger contexts. Thus, it will be important to investigate how social contexts, such as parent-child and teacher-student relationships are involved in children's socioemotional development. Despite the weaknesses and limitations, this study provided valuable information about the development of social, behavioral, and psychological functioning in Chinese children.

Acknowledgements

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Key Points

- Aggression, peer relationships, and depression are important and inherently connected aspects of children's socioemotional functioning.
- There are noticeable limitations in the studies in this area including the use of largely cross-sectional or two-wave longitudinal design, lack of rigorous control of confounding factors, such as the stability effect, and focus on Western samples.
- The analysis of the multiwave longitudinal panel data in this study indicated that aggression negatively contributed, in both direct and indirect manners, to later peer relationships, and positively contributed to depression. Peer relationships had negative direct and indirect effects on later aggression and depression.
- Effective strategies to help children with behavioral, social, and psychological problems should consider both personal and social factors from a developmental perspective.

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