Shyness-Sensitivity and Social, School, and Psychological Adjustment in Urban Chinese Children: A Four-Wave Longitudinal Study

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This study examined reciprocal contributions between shyness-sensitivity and social, school, and psychological adjustment in urban Chinese children. Longitudinal data were collected once a year from Grade 3 to Grade 6 (ages 9–12 years) for 1,171 children from multiple sources. Shyness-sensitivity positively contributed to social, school, and psychological difficulties over time, with the most consistent effects on peer preference and loneliness. Social and school adjustment negatively contributed to the development of shyness-sensitivity. The initial levels of shyness-sensitivity and social and school adjustment moderated the growth of each other, mainly as a resource-potentiating factor. The results indicate the significance of shyness-sensitivity for adjustment and the role of adjustment in the development of shyness-sensitivity in today's urban Chinese society.

As one of the major socioemotional characteristics, shyness-sensitivity plays an important role in children's social and psychological adjustment. Unlike other forms of social withdrawal such as preference for solitude based on a low motivation for interaction or social isolation due to peer rejection, shyness-sensitivity represents wary and anxious reactivity in challenging social settings (Rubin, Coplan, & Bowker, 2009). According to a theoretical model proposed by Asendorpf (1990), shyness-sensitivity may be derived from conflictual approach–avoidance motivations; shy-sensitive children are motivated to approach others for interaction, but their approach motivation is inhibited by fear or anxiety. Thus, in the literature (Rubin et al., 2009), shy-sensitive behavior is viewed as a reflection of internal fear, anxiety, and a lack of self-confidence. Shyness-sensitivity shares conceptual overlap with related terms such as conflicted shyness (Asendorpf, 2010; Coplan, Prakash, O'Neil, & Armer, 2004), wariness (Stevenson-Hinde & Shouldice, 1993), and anxious solitude (Gazelle & Ladd, 2003). Shyness-sensitivity is also conceptually and empirically linked to behavioral inhibition (e.g.,

García Coll, Kagan, & Reznick, 1984); they both tap individual reactivity to stressful situations, with the former focusing on the anxious response to social novelty or perceived social evaluation and the latter focusing on the dispositional characteristic to be vigilant and fearful when encountering unfamiliar social and nonsocial situations (Coplan & Armer, 2007; Rubin et al., 2009).

In Western societies, children who display shy-sensitive behavior are regarded as socially incompetent and likely to receive negative social evaluations and reactions from others and experience difficulties in social relationships (e.g., Asendorpf, 2010; Coplan et al., 2004; Gazelle & Rudolph, 2004). When they realize their difficulties in social situations, shy-sensitive children may develop negative self-perceptions and self-feelings such as loneliness and depression (e.g., Coplan et al., 2004; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). In addition, shy-sensitive children often lack active academic engagement in the classroom and receive inadequate assistance from others on schoolwork, which may result in poor academic performance (Hughes & Coplan, 2010). Longitudinal research has indicated that shyness-sensitivity in childhood predicts later adjustment problems in a variety of areas such as educational attainment, career stability, and mental health (e.g., Caspi, Elder, & Bem, 1988; Denissen, Asendorpf, & van Aken, 2008;

Rubin et al., 1995). Therefore, it has been argued that shyness-sensitivity and social anxiety represent a significant risk factor in psychopathological development (Achenbach & Edelbrock, 1981; Rubin et al., 2009).

The difficulties that shy-sensitive children experience may be related to the emphasis on assertiveness, competitiveness, and self-expression in society (e.g., Greenfield, Suzuki, & Rothstein-Fisch, 2006). Shyness-sensitivity appears to be related to less negative outcomes in societies where assertiveness and self-expression are less appreciated or encouraged (Chen & French, 2008; Eisenberg, Pidada, & Liew, 2001; Kerr, Lambert, & Bem, 1996). In a series of studies in Chinese children in the early 1990s, Chen and colleagues found that shyness-sensitivity was associated with positive peer relationships, school competence, and psychological well-being (e.g., Chen, Rubin, & Sun, 1992). In the traditional Chinese society where behavioral restraint and wariness are positively evaluated, the reserved and wary behavioral tendencies displayed by shy-sensitive children may help them obtain social approval and develop self-confidence and positive feelings about self and others (e.g., Chen, 2010; Kulich & Zhang, 2010).

Since the 1980s, especially in the past two decades, China has changed dramatically toward a competitive, market-oriented society, particularly in urban regions, due to its massive economic reform. The changes in social and economic systems have led to increased variations in income and fierce competition (Zhang, 2000). In response to the social and economic changes, schools in China have expanded their goals of education to help children learn skills that are necessary for adaptation in the new environment (Chen, 2010). Behavioral qualities that have traditionally been neglected such as self-expression, independence, and initiative taking are increasingly appreciated by individuals, especially in the young generations (Wang & Huang-pu, 2007). As a result, shy, wary, and restrained behavior is no longer viewed as adaptive. Empirically, Chen, Cen, Li, and He (2005) found in urban Chinese children that by the early part of the 21st century as the country became deeply immersed in a market economy, shyness-sensitivity was positively associated with social and psychological problems; shy-sensitive children were more likely than others to experience peer rejection and to display psychopathological symptoms such as depression. Similar results have been reported in other studies concerning relations between shyness-sensitivity or related phenomena and adjustment including social relationships, academic achievement, and emotional well-being (e.g., Chang et al., 2005).

Given the maladaptive nature of shyness-sensitivity in both Western and today's urban Chinese societies, it is important to investigate from a developmental perspective how shyness-sensitivity contributes to adjustment outcomes and how social and personal factors affect the development of shyness-sensitivity. Most of the studies of shyness-sensitivity or related constructs and adjustment have been cross-sectional and do not allow for inference for causal directions. The existing longitudinal studies (e.g., Eggum et al., 2012; Karevold, Coplan, Stoolmiller, & Mathiesen, 2011; Karevold, Røysamb, Ystrom, & Mathiesen, 2009) have focused mainly on the effects of shyness-sensitivity on later psychological problems such as anxiety and depression, with little attention to the predictive relations at different ages and bidirectionality of the relations. According to the developmental cascade model (Masten & Cicchetti, 2010), early child behaviors or adjustment problems may influence each other through expanding their effects across domains progressively over time. Thus, different domains of development may have cross-lagged effects in a successive manner. Longitudinal *panel* data from at least three assessment points are needed to examine the progressive cascading process with cross-time continuity controlled (e.g., Masten et al., 2005). Therefore, we conducted this four-wave longitudinal study in Chinese school-aged children with panel data collected on both shyness-sensitivity and indexes of social, school, and psychological adjustment to fill the gaps in the literature.

Shyness-Sensitivity and Social, School, and Psychological Adjustment

Because of their reserved and wary behavioral tendencies, shy-sensitive children may have fewer opportunities than others to obtain benefits from social interactions including the acquisition of social status in the group. For example, it has been found that shy-sensitive children may display difficulties in participating in class activities and in certain testing situations, and thus receive negative evaluations from teachers and peers (e.g., Crozier & Hostettler, 2003; Evans, 2010). Their unfavorable social experience may contribute further to the development of school and psychological difficulties such as poor academic achievement and feelings of loneliness and depression (e.g., Evans, 2010). Therefore, it is conceivable that shyness-sensitivity is likely to predict later adjustment problems (Rubin et al., 2009).

Relative to the literature on the significance of shyness-sensitivity, little is known about the contributions of adjustment experiences to the development of shyness-sensitivity. It is possible that shyness-sensitivity is biologically rooted, developmentally stable, and relatively robust to the influence of other factors (e.g., Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Kagan, 1997). On the other hand, it has been suggested that individual experiences play an important role in shaping temperament and personality characteristics including shyness-sensitivity (e.g., Chen & Schmidt, 2015; Rothbart & Bates, 2006). Researchers have found that social relationships such as peer rejection may modify individual socioemotional functioning of internalizing nature such as social anxiety, fearfulness, and solitary behavior (e.g., Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004; Rubin et al., 2009). Gazelle and Rudolph (2004), for example, found that the context of peer exclusion moderated the developmental trajectories of shy and solitary children. These children maintained and increased their tendency of social avoidance when they experienced high peer exclusion, but displayed increased levels of social approach and engagement with time in the absence of exclusion. Asendorpf (1994) also found in a longitudinal study that socially inhibited children, initially at the age of 4 years, who were socially and academically competent showed declined inhibition over a 6-year period.

It has been suggested (Asendorpf, 1994; Gazelle & Rudolph, 2004) that shy and anxious children often have the motivation to interact with others but the motivation is inhibited by their fear in challenging situations. The fear of shy-sensitive children typically persists and increases if they develop expectations of future peer rejection or mistreatment and if these expectations are repeatedly confirmed by experiences. However, positive social experiences may reduce their social fear and fear-based social avoidance motivation. Supportive social relationships and high social status create an environment that helps children develop feelings of security and self-confidence, which in turn reduce their shy-sensitive behavior in challenging settings. In Chinese schools, academic achievement is highly emphasized and is associated with children's social status and relationships (Chen, Rubin, & Li, 1997; Li, 2011). Children who have higher academic achievement are likely to receive social approval and support from teachers and parents, which may help them overcome their shy-sensitive tendency. In addition, peers may seek help from these children with academic work, which provides opportunities for them to display their strengths, develop self-confidence in social interactions, and establish supportive relationships. Therefore, it seems reasonable to argue that academic achievement may contribute negatively to the development of shyness-sensitivity.

It should be noted that although shyness-sensitivity and adjustment may contribute to each other, the contributions may not be balanced. The dispositional aspect of shyness-sensitivity (e.g., Rothbart & Bates, 2006; Rubin et al., 2009), for example, may make this behavioral characteristic less susceptible than social, school, and psychological adjustment to the influence of other factors. Shy-sensitive behavior is established earlier than peer relationships, academic achievement, and psychological functioning (Rubin et al., 2009). Thus, it is possible that the contributions of shyness-sensitivity to later social, school, and psychological adjustment are more evident than those of social, school, and psychological adjustment to the development of shyness-sensitivity.

In addition, contributions between shyness-sensitivity and specific aspects of adjustment (e.g., social and school vs. psychological) may be different. As indicated in previous studies (e.g., Asendorpf, 1994; Gazelle & Rudolph, 2004), for example, the influence of other factors on shyness-sensitivity typically occurs in social contexts through constant and dynamic feedback from peers and adults. Positive social and school experiences such as approval and support may help shy-sensitive children overcome their fearful reactions, whereas adverse experiences may facilitate the development of shy-sensitive behavior. Relative to the effects of social-contextual factors, the contributions of psychological adjustment such as loneliness and depression to shyness-sensitivity may be less evident and direct, involving more complicated processes. At the interpersonal level, research with Western children has indicated that peers and adults may have mixed responses such as sympathy, support, or rejection to loneliness and depression (e.g., Altmann & Gotlib, 1988; Connolly, Geller, Marton, & Kutcher, 1992; Qualter & Munn, 2002). Moreover, psychological problems are often neglected in the Chinese society (Chen, 2010) and thus may not elicit obvious responses from others that lead to more shy-sensitive behavior over time. At the personal level, children who feel lonely or depressed may react differently to their situations; whereas some children spend time alone, others may seek support such as talking to other people (Moore & Schultz, 1983; Woodward & Kalyan-Masih, 1990). The different coping strategies may have different effects on the development of

shy-sensitive behavior. Therefore, relative to social and school adjustment, psychological adjustment might have less consistent and evident effects on later shyness-sensitivity.

Developmental Patterns

Finally, we attempted to examine the general developmental patterns of shyness-sensitivity and adjustment in this study, focusing on how the initial status of shyness-sensitivity or adjustment might affect growth slopes of adjustment or shyness-sensitivity. The role of the initial status in shaping developmental patterns is basically about interaction between the initial status and time in predicting the outcome variable (Bollen & Curran, 2006), which may be conceptualized by the moderation models that researchers often use to describe adaptive and maladaptive development (e.g., Masten & Wright, 1998). According to the stress-buffering model (Cohen & Wills, 1985), for example, adverse personal or social conditions may make children particularly vulnerable to risks and exacerbate the development of behavioral or adjustment problems in the later years. In contrast, desirable conditions are a protective factor that reduces risks, buffers against maladaptive development, and thus protects children from developing further problems. In the present study, it is possible that children who were initially high on shyness-sensitivity might experience increased social and psychological problems and thus become more maladjusted over years. Similarly, children who experienced heightened initial adjustment problems such as peer rejection and school difficulties might display more shy-sensitive behavior over time. However, children who were initially non-shy-sensitive or well-adjusted might not develop further adjustment or behavioral problems. Statistically, the stress model may be represented by a significant positive growth (i.e., increase with time) of problems (e.g., peer rejection) or negative growth of competence (e.g., leadership) associated with initial aversive conditions (e.g., high shyness-sensitivity) and a nonsignificant or weaker growth pattern associated with initial desirable conditions (e.g., low shyness-sensitivity). Consistent with this model, it has been found among Western children that initial maladaptive functioning such as shyness-sensitivity predicted poorer social skills and predicted higher levels of depression (Karevold, Ystrom, Coplan, Sanson, & Mathiesen, 2012; Karevold et al., 2011), and initial poor social relationships and social exclusion positively predicted

increase in shy and withdrawn behaviors (e.g., Oh et al., 2008).

From a different perspective, the resource-potentiating model (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995) indicates that desirable conditions may serve to potentiate personal capacities or social resources and enhance adaptive development, whereas adverse conditions may suppress or inhibit adaptive development. According to this model, in the present study, children who were initially low on shyness-sensitivity might become increasingly competent in social, school, and psychological adjustment over time, and children who were initially well-adjusted might overcome their shyness-sensitivity tendency and display increasingly less shy-sensitive behavior. However, initial high shyness-sensitivity or adjustment difficulties would prevent children from developing better adjustment or behavioral outcomes. This model may be represented statistically by a significant positive growth of competence or negative growth of problems associated with initial desirable conditions (e.g., low shyness-sensitivity) and a nonsignificant or weaker growth associated with adverse conditions (e.g., high shyness-sensitivity).

The Present Study

The primary purpose of this longitudinal study was to examine reciprocal relations between shyness-sensitivity and social, school, and psychological adjustment and their developmental patterns. We focused on the period from third grade to sixth grade, which represents an important period of development in shyness-sensitivity. It has been found that shyness trajectories are typically separate in two main developmental periods: early childhood and mid to late childhood (Karevold et al., 2012). Relative to early childhood, shyness-sensitivity in mid to late childhood is more stable as observed by peers and more predictive of adjustment outcomes (Karevold et al., 2012). This period is also important for Chinese children as they engage in extensive social interactions (e.g., Chen, 2010). In Chinese schools, from middle childhood (e.g., third grade), academic tasks become more challenging and extracurricular and social activities start to increase, which results in greater pressure on children in social and school performance. Thus, it would be interesting to investigate how shyness-sensitivity contributes to adjustment and how adjustment experiences contribute to the development of shyness-sensitivity during this period. We focused on three main

aspects of adjustment that are important in school-age children: social adjustment including peer preference and leadership status, academic achievement, and psychological well-being including loneliness and depression.

On the basis of the literature (e.g., Chen et al., 2005; Coplan et al., 2004; Gazelle & Rudolph, 2004) and the discussion provided earlier, we first hypothesized that shyness-sensitivity and adjustment would uniquely contribute to each other, with their concurrent relations and stabilities controlled. That is, shyness-sensitivity would positively predict social, school, and psychological difficulties, and adjustment problems would positively predict shyness-sensitivity. We expected that contributions of shyness-sensitivity to adjustment might be more evident than those of adjustment to shyness. Moreover, social and school adjustment might have more evident effects on shyness-sensitivity than psychological adjustment. We also hypothesized that children's initial status of shyness-sensitivity or adjustment would moderate the growth of each other. We believed that the study would provide valuable information about the bidirectional and transactional nature of relations between one of children's important socioemotional characteristics and adjustment from a developmental perspective in a non-Western context.

Method

Participants

The original sample consisted of 1,171 (591 boys and 580 girls) third-grade children in nine randomly selected ordinary elementary schools in Beijing, the 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 was located. There were 30 classes, with approximately 40 students in each class. The initial mean age of the participants was 9 years 4 months ($SD = $ 8 months), and the mean age of the participants in the last wave of data collection was 12 years 4 months ($SD = $ 8 months). The core curriculum was stipulated by the Ministry of Education in China and identical in the region, including Chinese, mathematics, and English. The structure and organization of elementary schools were also similar. 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 head teacher is designated to each class, who often teaches one major course and takes care of the daily activities of the class. Students are typically not allowed to switch classrooms, and they 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 of the children (98%) were from intact families. Due to the "one-child-per-family" policy that was implemented in the late 1970s, 92% of the children were only children in the family; others had one or more siblings. The participants came from families with mostly low to middle socioeconomic status. Preliminary analyses indicated nonsignificant differences between the different types of families on the variables or relations of interest in the study.

The follow-up data were collected each year in the same schools for Grades 4–6. From the original sample, 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.

Procedure

The longitudinal data were collected each time near the end of the school year (May and June) for 4 consecutive years. The first wave of data was collected in 2003. At each time, we group administered to the children a peer assessment measure of shyness-sensitivity and a sociometric nomination measure. Children also completed a self-report measure of loneliness and depression. Our research team carefully examined the items in the measures, using a variety of strategies, such as extensive discussion in the research group, interviews with children and teachers, and psychometric analysis. Children's leadership status and academic achievement were obtained through school records. All the measures had been used and proved to be reliable, valid, and appropriate in Chinese children in previous studies (e.g., Chen, Rubin, & Li, 1995; Chen et al., 2004; Chen et al., 2005). Written consent was obtained from all children and their parents through the school. The participation rate was approximately 95% at each time.

Peer Assessments of Shyness-Sensitivity

We administered to the children a peer assessment measure of shyness-sensitivity, adopted from the Revised Class Play (Masten, Morison, & Pellegrini, 1985). Following the procedure by Masten et al. (1985), the research assistant read 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 from a list of classmates. Children were permitted to nominate both same-sex and other-sex peers. 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.

The original Class Play measure consisted of items in broad areas of social functioning. Only the shyness-sensitivity subscale was of interest in this study. The measure consisted of four items assessing shy-sensitive behavior in social context (e.g., "Very shy," "Feelings get hurt easily"); the constellation of the items indicates social wariness and sensitivity from the peers' perspective (Masten et al., 1985; see Chen et al., 1992, for further detail about the measure in Chinese children). The items loaded on a single factor in the present study. The measure has proved to be reliable and valid in previous studies in China (e.g., Chen et al., 1997, 2005). The internal reliabilities were between .71 and .76 in Grades 3–6 in the present study. Test–retest reliability (interval of 2 weeks) of the measure was .84 in a different sample ($N = 132$) of Chinese children.

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 or she least liked to be (positive and negative nominations). As suggested by other researchers (e.g., Coie, Terry, Lenox, Lochman, & Hyman, 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. Test–retest reliabilities (interval of 2 weeks) were .77 and .93 for positive and negative sociometric nominations, respectively, in a different sample ($N = 132$) of Chinese children. The measure has been used and

proved valid with Chinese children (e.g., Chen et al., 1995). Following procedure of Coie et al. (1995), an index of peer preference was formed by subtracting negative nomination scores from positive nomination scores. Peer preference indicates likability of the child in the class, an aspect of peer relationships that has been shown to be an important index of social competence and adjustment in Chinese children (e.g., Chen, Rubin, Li, & Li, 1999).

Leadership

There are various formal student organizations, which are often hierarchical in nature, in Chinese schools. "Leaders" of these organizations, elected by peers and teachers, are usually believed to be good students in social and school performance. Leadership at a higher level such as school level is considered as an indicator of greater competence than that at a lower level such as the class or within-class group level. Leadership status is moderately associated with other measures of social and school achievement (rs = .40s to .50s; Chen et al., 1995). Data on student leadership were collected from school records. Leadership was coded as follows: Students who were group leaders within the class received a score of 1; students who held leadership positions at the class level and at the school level received scores of 2 and 3, respectively; students who did not hold leadership positions were given a score of 0. Leadership scores were standardized within the class. This information has proved to be a useful and reliable indicator of school competence in Chinese children (e.g., Chen et al., 1995).

Academic Achievement

Information concerning academic achievement in Chinese, mathematics, and English 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 subject was 100, and a score below 60 was usually considered as failure in the course. Chinese, mathematics, and English were three major subjects taught in Chinese schools, and the grades of these three subjects have been found to be a valid measure of school academic achievement in Chinese children (e.g., Chen et al., 1997). In the present study, scores on Chinese, mathematics, and English were significantly correlated, rs = .57–.84, ps < .001, and were summed

and standardized within the class to form a single index of academic achievement.

Loneliness and Social Dissatisfaction

Children's loneliness and social dissatisfaction were assessed by a self-report measure, adapted from Asher, Hymel, and Renshaw (1984). Children were requested to respond to 16 self-statements (e.g., "I have nobody to talk to," "I feel lonely") using a 5-point scale (1 = *not at all true*, 5 = *always true*). The average score of the responses was calculated, with higher scores indicating greater loneliness. The measure has been used and proved reliable and valid in previous studies in Chinese children (e.g., Chen et al., 2004). The items loaded on a single factor in the present study. The internal reliabilities were .86 to .91 in Grades 3–6.

Depression

Children's depression was measured by administering a Chinese version of 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 that 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; Chen, Yang, & Wang, 2013). There were three alternative responses to each item from which the participant chose the one that best described his or her experience in the past 2 weeks. The items centered on a given thought, feeling, or behavior associated with depression, including self-deprecation, reduced social interest, anhedonia, self-hate, self-blame, sleep disturbance, fatigue, somatic concerns, and reduced appetite. The items were scored 0, 1, or 2, with a higher score indicative of greater depression. The average score of the responses was calculated, with higher scores indicating greater depression. The measure has proved reliable and valid in Chinese children (e.g., Chen et al., 2013). The internal reliabilities were .83 to .86 in Grades 3–6 in the present study.

Results

Analytic Strategies

The main purpose of the current study was to examine the reciprocal relations between shyness and adjustment as well as their developmental patterns. We conducted the following analyses to examine the issues. First, we conducted confirmatory factor analysis to test the measurement model of latent constructs. Measurement invariance across time and gender was tested. Following the procedure by Bandalos and Finney (2001), we used item parcels to form multiple indicators of each latent construct in the confirmatory factor analyses and the subsequent structural equation modeling (SEM) analyses. The four indicators of the shyness construct were peer assessment item scores. Since the constructs of loneliness and depression were unidimensional, the items in each of these measures were assigned randomly to form the parcels for the two constructs. Loneliness was indicated by two indicators from the loneliness items. Depression was indicated by two indicators that were parceled from the depression items. Second, we tested gender differences in means using the multigroup SEM approach (Green & Thompson, 2012). Third, we conducted SEM analyses to test the reciprocal relations between shyness and adjustment. As suggested by Marsh and Hau (1996), the residuals of the same variable across different times were allowed to correlate. As suggested by Granger (1980) and Kenny (2005), to maintain the symmetrical condition for examining longitudinal reciprocal relations between shyness and adjustment, the analyses for each adjustment variable were conducted separately. We first tested the stability of shyness and the adjustment variable and then tested the full model with all cross-lagged paths from one grade to the next to examine the relations between shyness and each adjustment variable. Finally, we tested the moderating effects of the intercepts of shyness and the adjustment variable on their slopes or growth patterns in a latent growth modeling framework (Curran, Stice, & Chassin, 1997; Muthén & Muthén, 2010). The conceptual growth model is presented in Figure 1. Classroom intraclass correlations were < .01 for all the variables, indicating there were no cluster effects for the classroom.

All analyses were conducted using Mplus 6.0 (Muthén & Muthén, 2010). We used full information maximum likelihood to estimate missing data for those who did not participate in all waves of data collection. The education levels of fathers and mothers were used as auxiliary variables to adjust for missing data.

Measurement Models

The factorial invariance for the constructs of shyness, loneliness, and depression was tested across
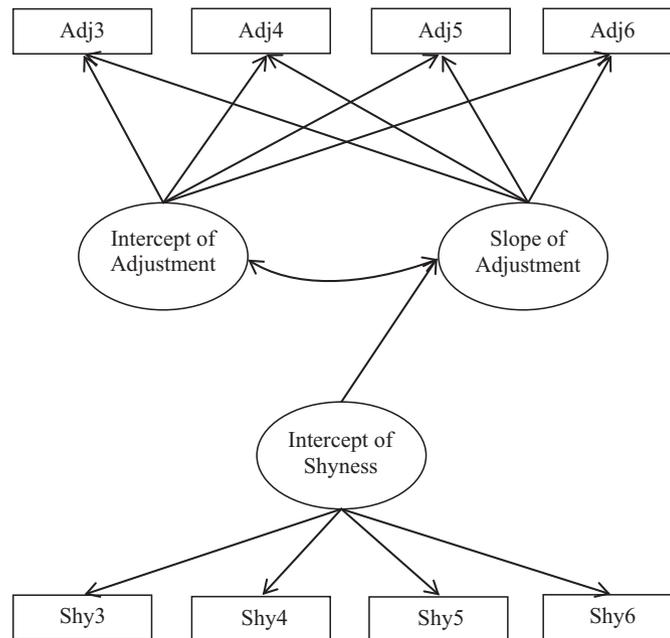
Figure 1. The conceptual model for the moderating effects of intercepts on the growth of adjustment. Adj = adjustment variable; Shy = shyness. The number after the variable stands for grade.

four times of measurement and gender, using the procedure recommended by Little (2013). We fitted less constrained models first and then proceeded to the next more constrained model if the changes in model fit were modest (e.g., ΔCFI [comparative fit index] < 0.01; Cheung & Rensvold, 2002). For each construct, the patterns for the loadings and intercepts were found to be consistent in all models. The fully constrained models, which had equal loadings and intercepts across time and gender, had adequate levels of fit, CFIs = 0.94–.98, Tucker Lewis Indexes (TLIs) = 0.92–0.95, root mean square errors of approximation (RMSEAs) = 0.06–0.08. These results indicated that the measurement of these constructs were invariant across time and gender in our study. The overall measurement model with all constructs and four time points showed adequate factor loadings, ranging from .40 to .88. The standard errors were low (below .04), suggesting robust model estimation. The goodness of fit measures were satisfactory, $\chi^2(413) = 1,589.36$; $\chi^2/df = 3.85$, CFI = 0.94, TLI = 0.93, RMSEA = 0.045.

Gender Differences

Next, we analyzed gender differences on all variables using the SEM multigroup approach (Green & Thompson, 2012). In the analyses, we compared the constrained (factor means were constrained to be equal across gender) with nonconstrained models. The differences between the two models were significant for all variables, $\Delta\chi^2(4) = 22.04$ (shyness) to 115.85 (leadership), $ps < .001$. Specifically, boys had lower scores on peer preference, leadership, academic achievement, and shyness-sensitivity, and higher scores on loneliness and depression. No significant grade effects were found. The final model allowed for latent factor means to differ across gender but not across time. The means and standard deviations for boys and girls on the variables estimated from the final model are presented in Table 1.

Relations Between Shyness-Sensitivity and Social, School, and Psychological Adjustment

Correlations among the adjustment variables and shyness-sensitivity are presented in Table 2. For each adjustment variable, we first tested the stability of shyness-sensitivity and the adjustment variable. Stability coefficients were high and were all statistically significant, βs = .66–.72 for peer preference, .55–.57 for leadership, .66–.71 for academic achievement, .52–.56 for loneliness, .66–.72 for depression, and .72–.88 for shyness, $ps < .001$. The results indicated that these variables were stable over time.

Next, we tested the full model with all cross-lagged paths from one grade to the next to examine the relations between shyness-sensitivity and each

Table 1

Means and Standard Deviations of Variables for Boys and Girls Across Four Grades

| | Boys | | Girls | | |
Variable	M	SD	M	SD	$\chi^2(df = 4)$
Peer preference	−0.08	0.99	0.13	1.30	56.97***
Leadership	−0.16	0.86	0.17	1.12	115.85***
Academic achievement	−0.20	0.99	0.12	1.31	109.49***
Loneliness	1.86	0.63	1.70	0.86	38.95***
Depression	1.32	0.26	1.27	0.36	26.97***
Shyness	−0.15	0.99	0.29	1.32	22.04***

Note. Nonsignificant grade differences were found on the variables, so data were not presented for each grade.
***$p < .001$.

Table 2

Correlations Among Variables

	1	2	3	4	5
Grade 3					
1. Peer preference					
2. Leadership	.33***				
3. Academic achievement	.46***	.29***			
4. Loneliness	−.32***	−.22***	−.28***		
5. Depression	−.30***	−.21***	−.30***	.65***	
6. Shyness	−.09***	.05	−.11***	.07**	.08**
Grade 4					
1. Peer preference					
2. Leadership	.35***				
3. Academic achievement	.47***	.40***			
4. Loneliness	−.35***	−.26***	−.35***		
5. Depression	−.24***	−.23***	−.30***	.69***	
6. Shyness	−.24***	−.01	−.21***	.22***	.15***
Grade 5					
1. Peer preference					
2. Leadership	.37***				
3. Academic achievement	.41***	.39***			
4. Loneliness	−.34***	−.21***	−.33***		
5. Depression	−.23***	−.21***	−.25***	.61***	
6. Shyness	−.26***	−.07**	−.13***	.23***	.19***
Grade 6					
1. Peer preference					
2. Leadership	.33***				
3. Academic achievement	.44***	.32***			
4. Loneliness	−.33***	−.25***	−.33***		
5. Depression	−.25***	−.19***	−.29***	.58***	
6. Shyness	−.29***	−.11***	−.19***	.24***	.18***

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

adjustment variable. The fit of the full model was compared to that of an acceptable, modified null model with variances of the indicators being unchanged over time (Widaman & Thompson, 2003). Following Little's (2013) procedure, incremental fit indexes for each panel model were then computed based on the comparison. There was a significant difference between the stability model and the full model for each adjustment variable, $\Delta\chi^2(6) = 13.44–56.81$, $p < .05$, while other fit indexes were similar for the two models (CFIs = 0.91–0.96, TLIs = 0.91–0.95, RMSEAs = 0.04–0.07). The cross-lagged coefficients of the full models are presented in Figure 2. In general, shyness-sensitivity had significant and negative effects on peer preference and academic achievement and positive effects on loneliness and depression across grades. Shyness-sensitivity also had a significant and negative effect on leadership from Grades 5 to 6. On the other hand, peer preference in Grade 5, academic achievement in Grades 3 and 5, and leadership in Grade 4 had significant and negative effects on later shyness-sensitivity. No significant effects of loneliness and depression were found on later shyness-sensitivity. The pattern of the results suggested that shyness-sensitivity and social and school adjustment contributed to each other. However, the relations between shyness-sensitivity and psychological adjustment (loneliness and depression) are unidirectional, from shyness to psychological adjustment.

Multigroup analyses were conducted to examine gender differences in the stabilities and the relations. No significant gender differences were found in the structural patterns or estimates.

The Effects of Intercepts on Slopes

We tested the moderating effects of the intercepts of shyness-sensitivity and the adjustment variables on their slopes or growth patterns in a latent growth modeling framework (Curran et al., 1997; Muthén & Curran, 1997; Muthén & Muthén, 2010). As illustrated in Figure 1, in these analyses, the intercept of shyness-sensitivity or the adjustment variable was used as a predictor of the slope of the cross-domain variable (e.g., the intercept of shyness predicted the slope of the adjustment variable). At the same time, the within-domain correlation between the intercept of shyness-sensitivity or the adjustment variable and its own slope was estimated. As shown in Table 2, there were negative within-domain relations between intercepts and slopes for all variables except leadership. Lower initial scores were related to rising slopes and higher
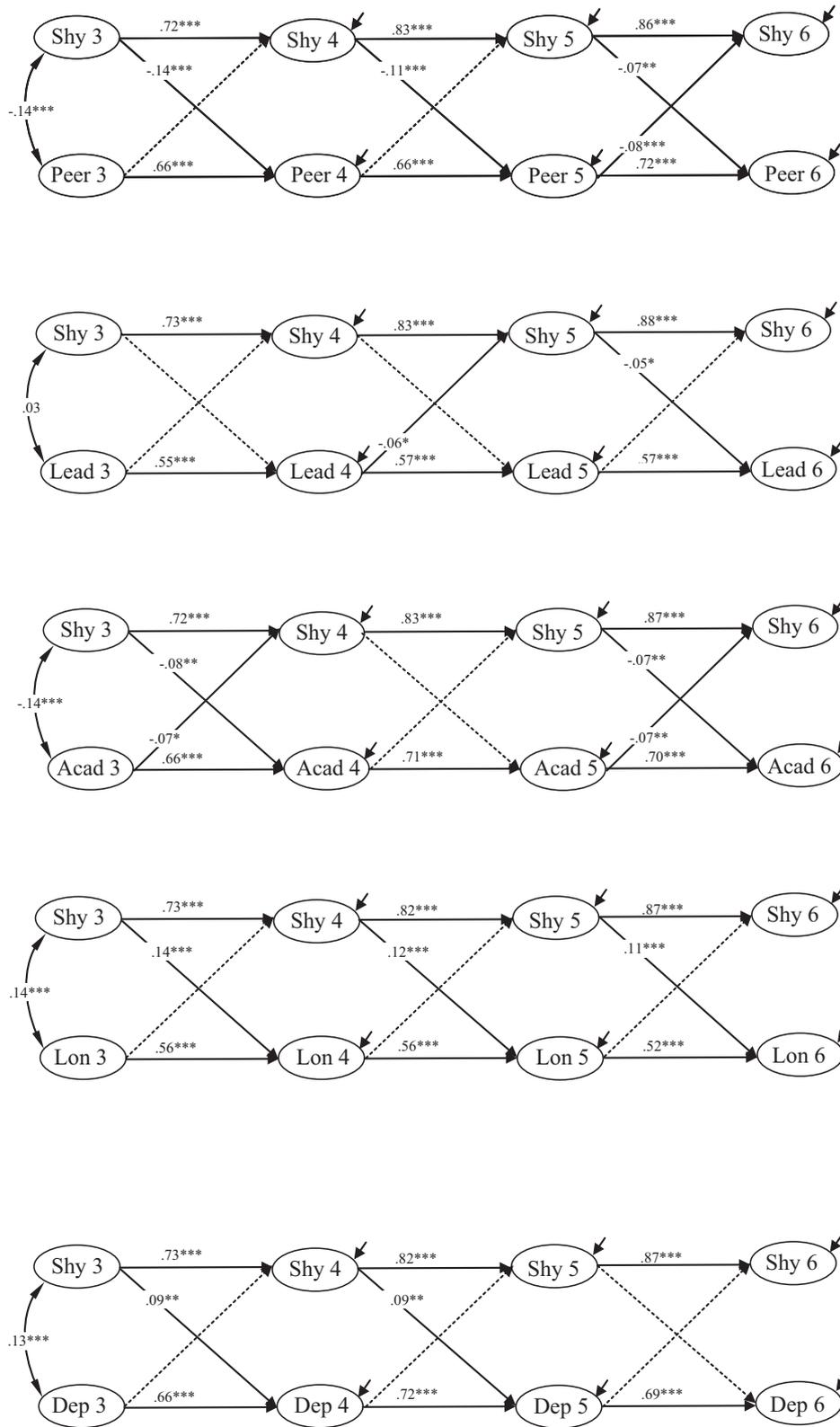
Figure 2. Estimates based on the full model with significant paths (solid lines) and nonsignificant paths (dashed lines; effects ranging from −.07 to .04, $p > .05$; residuals of within-time latent variables correlated). Shy = shyness; Peer = peer preference; Lead = leadership; Acad = academic achievement; Lon = loneliness; Dep = depression. The number after the variable stands for grade.
*$p < .05$. **$p < .01$. ***$p < .001$.

initial scores were related to declining slopes. Further analyses indicated that the results reflected the "regression-toward-the-mean" effect.

The results concerning the cross-domain intercept–slope relations (Table 3) showed that the intercept of shyness-sensitivity was significantly associated with the slopes of peer preference and leadership, indicating that the initial status of shyness-sensitivity moderated the growth of these adjustment variables. We then conducted a simple slope analysis following the Aiken and West (1991) procedure to examine the nature of the moderating effects. As shown in Figure 3, children with lower initial shyness-sensitivity scores (1 SD below the mean) had a positive growth in peer preference, whereas children with higher initial shyness-sensitivity scores (1 SD above the mean) had a negative growth in peer preference. Children with lower initial shyness-sensitivity scores had a positive growth in leadership, whereas the growth slope was nonsignificant for children with higher initial shyness-sensitivity scores. In addition, the results indicated that the intercepts of leadership and academic achievement significantly predicted the slope of

Table 3

Within- and Cross-Domain Relations Between the Intercepts and Slopes of Shyness-Sensitivity and Adjustment Variables

Slope	Coefficient	SE	t value
Peer preference			
Intercept of peer preference	−.24	0.05	−4.52***
Intercept of shyness	−.13	0.05	−2.62**
Leadership			
Intercept of leadership	−.21	0.11	−1.89
Intercept of shyness	−.16	0.08	−2.00*
Academic achievement			
Intercept of academic achievement	−.21	0.08	−2.63**
Intercept of shyness	.01	0.07	0.09
Loneliness			
Intercept of loneliness	−.51	0.06	−9.12***
Intercept of shyness	.09	0.06	1.50
Depression			
Intercept of depression	−.52	0.04	−12.09***
Intercept of shyness	.03	0.05	0.59
Shyness			
Intercept of shyness	−.27	0.05	−5.04***
Intercept of peer preference	−.05	0.04	−1.20
Intercept of leadership	−.15	0.05	−2.74**
Intercept of academic achievement	−.13	0.05	−2.69**
Intercept of loneliness	.06	0.05	1.07
Intercept of depression	.05	0.05	0.99

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

shyness-sensitivity. As shown in Figure 4, simple slope analysis revealed that children with higher initial leadership scores had negative growth in shyness-sensitivity, but the slope was nonsignificant for children with lower initial leadership scores. Similarly, children with higher, but not lower, initial academic achievement scores had negative growth in shyness-sensitivity.

Discussion

In this four-wave longitudinal study in a sample of urban Chinese children, we found that shyness-sensitivity had significant contributions to adjustment difficulties including poor peer relationships, low academic achievement, and psychological distress. Shyness-sensitivity also moderated the growth pattern of children's social adjustment. Moreover, children's social and school competence predicted lower levels of shyness-sensitivity over time and moderated the growth pattern of shyness-sensitivity. These results may help us understand how shyness-sensitivity and different aspects of adjustment contributed to the development of each other in the modern Chinese context.

Relations Between Shyness-Sensitivity and Adjustment

The results first indicated that shyness-sensitivity had significant and unique contributions to later social, school, and psychological adjustment over and above the stability effects. Consistent with the literature (e.g., Chen et al., 2005; Rubin et al., 2009) and our hypotheses, shyness-sensitivity negatively contributed to the development of social and school competence and positively contributed to the development of adjustment problems. Although the trend of the contributions was similar across different aspects of adjustment, the effects appeared more evident and coherent across different periods in predicting peer preference and loneliness. It has been found that peers are often particularly sensitive to behaviors that children display in social interactions (e.g., Chen et al., 2005). As China becomes an increasingly competitive market-oriented society and accepts more individualistic values (Zhang, 2000), shy-sensitive behavior may be viewed by peers as incompetent and deviant. Thus, shy-sensitive children are likely to develop difficulties with peers (Chang et al., 2005; Chen et al., 2005). The unfavorable peer evaluations and responses that shy-sensitive children receive may elicit their negative views about others and make them particularly vulnerable
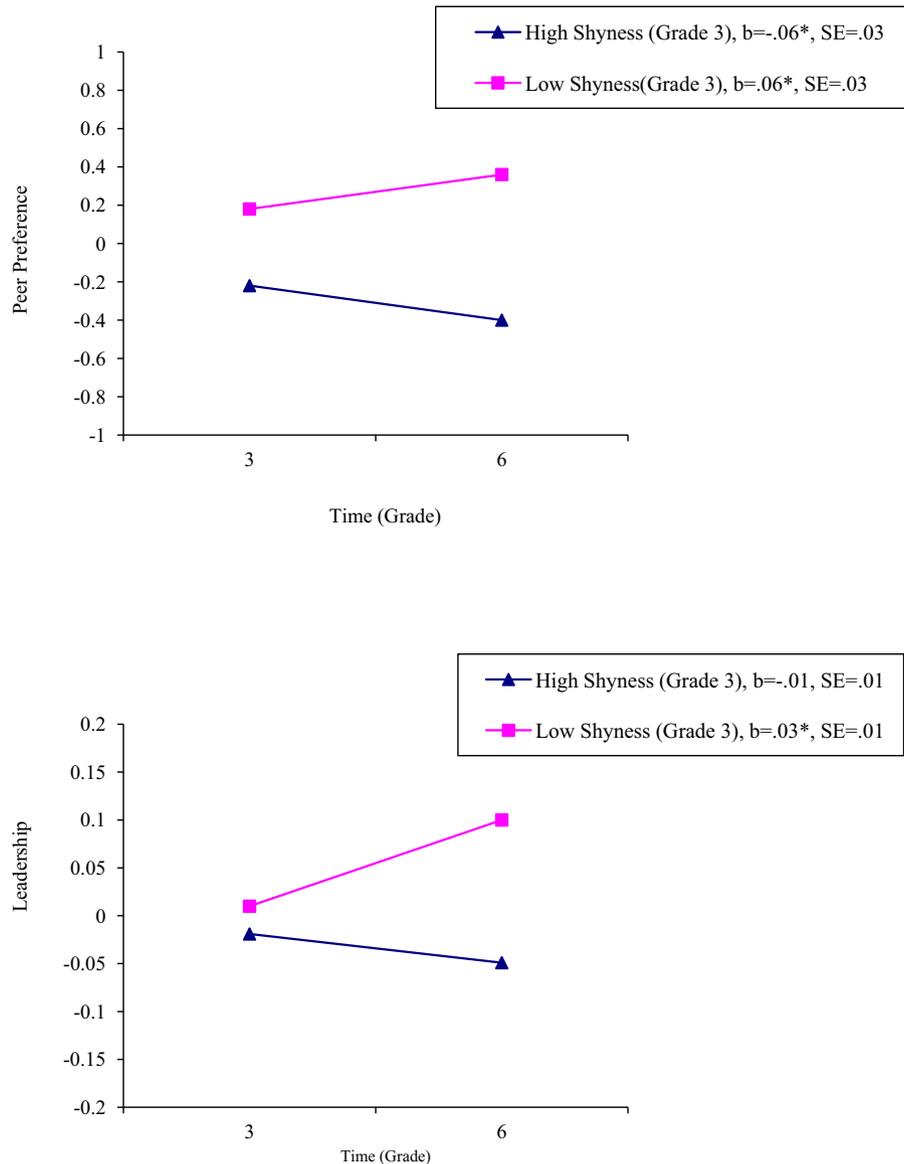
Figure 3. Moderating effects of intercepts of shyness on the growth of adjustment from Grade 3 to Grade 6 (equivalent to ages 9–12 years).
*p < 05.

to feelings of loneliness. Relative to its relations with peer preference and loneliness, shyness-sensitivity may be associated with other aspects of adjustment such as leadership and academic achievement through more complicated social-cognitive processes (e.g., classroom organization, teacher–student relationships, assistance from others, and motivation), which may make the relations less straightforward.

Our results showed that whereas shyness-sensitivity contributed to social and school adjustment, social and school adjustment contributed to the development of shyness-sensitivity. Shyness-sensitivity has been conceptualized as a social-behavioral

characteristic that is biologically rooted and stable over time (e.g., Asendorpf, 1990; Rubin et al., 2009). Some theorists and researchers (Rothbart & Bates, 2006; Rubin et al., 2009) have argued that although genetic factors and maturation constitute a foundation for the development of dispositional or temperamental characteristics including shyness-sensitivity, individual experiences during socialization play an important role, as maintenance and constraining forces, in shaping the characteristics. Nevertheless, relatively little research has been conducted on how adjustment experiences affect the development of shyness-sensitivity. Thus, our
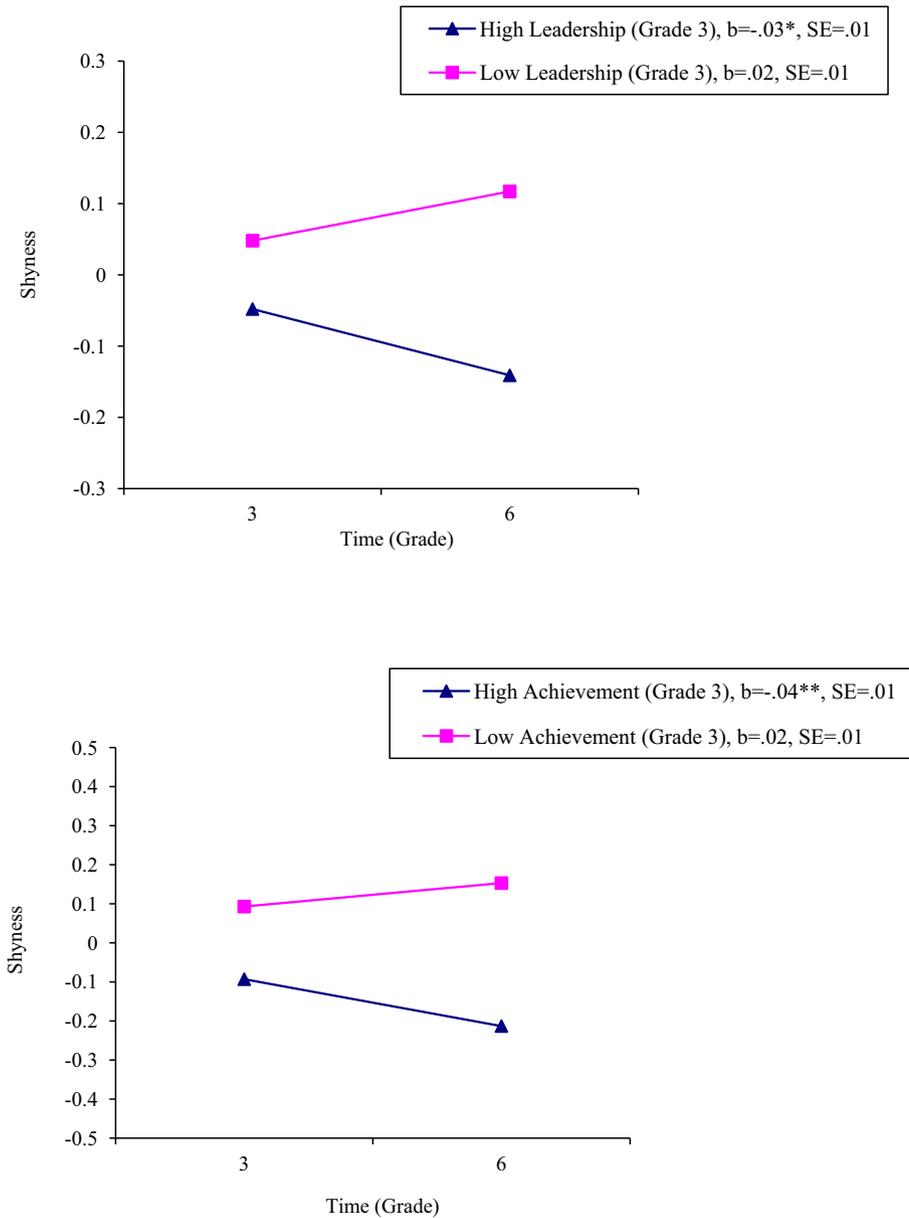
Figure 4. Moderating effects of intercepts of social and school adjustment on the growth of shyness from Grade 3 to Grade 6.
*p < .05. **p < .01.

findings concerning the effects of social and school adjustment on shyness-sensitivity represent additional new findings of the study. The effects of social and school experiences on shyness-sensitivity may involve peer and adult attitudes and responses. For example, children who are socially and academically competent may receive respect, approval, and support from others. The positive feedback may help children control their anxiety and fear in social interactions. In contrast, children who perform poorly in social and academic areas may receive disapproval and rejection from others,

which may reinforce children's anxious and fearful reactions and facilitate the display of shy-sensitive behavior (Asendorpf, 1994; Gazelle & Rudolph, 2004).

Nevertheless, it is the case that relative to the effects of shyness-sensitivity on adjustment, the effects of adjustment, particularly in psychological areas, on shyness-sensitivity were less evident. Unlike the largely bidirectional relations between shyness-sensitivity and social and school adjustment, the relations between shyness-sensitivity and psychological adjustment appeared to be unidirec-

tional; no significant effects of loneliness and depression were found on later shyness-sensitivity. The lack of significant effects of loneliness and depression on shyness-sensitivity may be related to the ambivalent attitudes and responses of others and self toward psychological problems (Qualter & Munn, 2002). For example, peer and teachers often show mixed reactions such as sympathy, support, or rejection to children who display loneliness and depression (e.g., Altmann & Gotlib, 1988; Connolly et al., 1992). This may be particularly the case in the Chinese society in which children's psychological problems have traditionally been neglected and may not trigger an aversive social response (Chen, 2010).

The Effects of Initial Status on the Developmental Patterns of Shyness-Sensitivity and Adjustment

Our analysis of growth patterns indicated that children's initial status (i.e., intercepts) of shyness-sensitivity and adjustment variables were negatively related with their own slopes. The slope of social, behavioral, and psychological adjustment was declining for children with initial high scores and rising for children with initial low scores on the variable. Further analyses of the patterns revealed that the results reflected the trend of the "regression toward the mean" over time: Social, behavioral, and psychological adjustment or problems declined for children with initial high scores and rose for children with initial low scores on the adjustment or problem variable.

More interesting results were the effects of the intercepts of shyness-sensitivity on the growth slopes of adjustment and effects of the intercepts of adjustment on the growth slopes of shyness-sensitivity. First, we found that initial low shyness-sensitivity predicted positive growth of peer preference and leadership status over time. The results supported the resource-potentiating model (Kupersmidt et al., 1995), which indicates that children's early advantages serve to potentiate personal and social resources and enhance adaptive development. The results also showed that consistent with the stress model (Cohen & Wills, 1985), initial high shyness-sensitivity contributed to negative growth of peer relationships. Thus, the early adverse condition of high shyness-sensitivity not only inhibited adaptive development (e.g., leadership) but also led to increased difficulties in peer relationships.

In addition, we found that children's initial status of leadership and academic achievement moderated the growth of shyness-sensitivity. Initial high

leadership status and academic achievement was associated with negative growth of shyness-sensitivity, indicating that positive social and school adjustment is beneficial to the acquisition of approval and support from others, which may help children develop confidence in social interactions and display less shy-sensitive behavior over the years. These results were also consistent with the resource-potentiating model (Kupersmidt et al., 1995). Given that relatively little is known about how individual experiences affect the developmental pattern of shyness-sensitivity, the present study shed some light on the role of social and school adjustment in regulating the growth of shyness-sensitivity.

Conclusions, Limitations, and Future Directions

The present study made several major contributions to our understanding of children's socioemotional development. First, this is the first longitudinal study of the long-term significance of shyness-sensitivity for adjustment in a society that has undergone massive social, economic, and cultural changes in the past decades. The results, especially in combination with the previous findings based on cross-cultural (e.g., Chinese and North American children; Chen et al., 1992) and historical cohort design (e.g., cohorts of children at different times of the societal transition; Chen et al., 2005) studies, indicate that children's socioemotional functioning and adjustment need to be understood from social-contextual as well as developmental perspectives. Second, as indicated earlier, the existing research has focused mostly on how shyness affects adjustment. Our results support the view that shyness-sensitivity and perhaps other temperament characteristics may be shaped by individual experiences in social and school adjustment (e.g., Chen & Schmidt, 2015; Rothbart & Bates, 2006). The results indicate the bidirectional and transactional nature of the relations among different aspects of human development. To what extent the impact of adjustment on shyness-sensitivity is "universal" or specific to certain societies needs to be investigated further in the future. Given that shyness-sensitivity is regarded as incompetent and maladaptive in both today's China and most Western nations, the general developmental patterns and adjustment outcomes of shyness-sensitivity may be similar in Chinese and Western children. However, relations between shyness-sensitivity and specific aspects of adjustment may be constrained by particular contextual factors. It will be interesting, for example, to examine whether academic achievement has similar effects in

societies where it is not emphasized as much as in China. Third, the multiwave data collected in this study allowed us to examine the effects of initial status of shyness-sensitivity and adjustment on their growth patterns, which were rarely examined in previous studies. The resource-potentiating and stress-exacerbating functions of children's initial behavioral, social, and academic status in development ("the rich get richer and the poor get poorer" effects) found in the study suggest that helping children develop competencies in the early years may be an efficient strategy to promote adaptive development and to prevent maladaptive development.

Several limitations and weaknesses in present study should be noted. First, the study was concerned with relations among shyness-sensitivity and adjustment from middle childhood to early adolescence. One needs to be careful in generalizing the results to other developmental periods. For example, in high school, children engage in more extensive and intimate peer interactions and, at the same time, face greater pressure to perform well academically to acquire better opportunities for higher education. In addition, as a result of the development of social-cognitive abilities, children become more aware of their own psychological conditions and more sensitive to social evaluations. Therefore, it is possible that social, school, and psychological adjustment has a more comprehensive impact on shyness-sensitivity from late childhood.

We focused in this study on mutual contributions of shyness-sensitivity and adjustment. The relations between socioemotional functioning including shyness-sensitivity and adjustment occur in larger contexts. For example, parenting practices, family relationships, and friendships are likely to affect children's development of socioemotional functioning. Therefore, it will be important to investigate how broad contexts are involved in the development of social behaviors and adjustment. Despite these limitations, the results of the present study indicated the significance of shyness-sensitivity for adjustment and the role of adjustment in the development of shyness-sensitivity in today's urban Chinese children.

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