

THE IMPACT OF POSITIVE SCHOOL EXPERIENCES AND SCHOOL SES ON DEPRESSIVE SYMPTOMS IN CHINESE CHILDREN: A MULTILEVEL INVESTIGATION

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Abstract: The current study investigates the effects of teacher support, school connectedness, and school socioeconomic status (SES) on youth depressive symptoms. Data were collected from a sample of 881 students in Grade 6 from 10 primary schools in Northwest China. Hierarchical linear modeling indicated that higher levels of teacher support, school connectedness, and school SES were significantly associated with fewer depressive symptoms. Further, the relationships between school-level SES and youth depressive symptoms varied by the participant's perceived level of teacher support and perceived level of school connectedness. These findings underscore the importance of positive school experiences on child psychological outcomes. Implications for future research on Chinese youth are discussed.

Keywords: teacher support, school connectedness, school SES, depressive symptoms, Chinese children

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Childhood onset depressive symptoms have been associated with greater rates of depression recurrence (Merry, McDowell, Wild, Bir, & Cunliffe, 2004), faster relapse rates (Alloy et al., 2006), increased chronicity of episodes, and longer duration of illness (Lewinsohn, Shankman, Gao, & Klein, 2004). Moreover, some longitudinal cohort studies have tested the developmental continuity between childhood and adulthood diagnoses and found that the link is both homotypic and heterotypic; that is, youth depressive symptoms are associated with increased risk of adult depression and other types of mental illness (Stringaris & Goodman, 2009, 2013). Depressive episodes in childhood often have debilitating consequences across multiple life domains, including poor academic achievement at school and conflicting relationships with family members and peers (Kaminer, Connor, & Curry, 2007). The most serious outcome is suicide (Centers for Disease Control and Prevention, 2015). Indeed, suicide is an important cause of death among individuals aged 10 to 14 years in both the United States and China (Anderson & Smith, 2003; Cui, Cheng, Xu, Chen, & Wang, 2011). Given the future risk for major depression and the significant functional impairment related to child depressive symptoms, assessing the ecological correlates of depressive symptoms among children is critical. In sharp contrast to the amount of research conducted in the United States and other developed countries, few studies on youth depressive symptoms have been conducted in China, particularly in the economically disadvantaged areas of Northwest China.

As school-aged children and adolescents spend at least half of their waking hours in school except during holidays, schools present one of the most influential environments for developing youths (Smith, Boutte, Zigler, & Finn-Stevenson, 2004). In a cultural setting like China's, which emphasizes academic competence and interpersonal harmony, support from teachers and a sense of connectedness in schools could be particularly valuable for students (Stewart & Sun, 2012; Zhang, Li, Gong, & Ungar, 2013). Besides the direct protective effect on mental health, positive school experiences have been found to act as a buffer for youth at risk, such as those living in rural poverty (Davidson & Adams, 2013), and those in a racial or sexual minority (Joyce & Early, 2014). In contrast, negative school experiences, often characterized by unfair treatment from teachers, peer rejection, and poor disciplinary climates, tend to lower student-perceived teacher support and school connectedness, resulting in more depressive symptoms (Kuperminc, Leadbeater, & Blatt, 2001; Loukas & Robinson, 2004). Thus school context is important in protecting children and adolescents from depressive symptoms.

Along with China's rapid economic development over the last three decades, income inequality between urban and rural areas has increased. Children and adolescents in rural areas commonly grow up in households with financial strains. The majority of rural youth attend local schools with limited social capital, reducing their later educational and career prospects. Chinese youth in rural schools receive little help with psychological issues, and there is limited research comparing rural school youth and urban school youth in Northwest China with regard to depressive symptoms. To fill this gap, the current study collected data from children and adolescents from schools with diverse socioeconomic status (SES) in Shaanxi province, a typical northwestern

inland region characterized by prevailing poverty and an increasing urban–rural economic gap. The goal of the present study is to examine school-related predictive factors associated with youth depressive symptoms. Specifically, this study examines the following research questions: (a) To what extent are student-perceived teacher support, student-perceived school connectedness, and school SES each associated with youth depressive symptoms? (b) To what extent does the association between school SES and youth depressive symptoms vary by student-perceived teacher support? and (c) Do the effects of school SES on youth depressive symptoms depend on student-perceived school connectedness?

Literature Review

Perceived Teacher Support and Youth Depressive Symptoms

Students' perceptions of support from teachers have been vitally linked to psychological outcomes for school-aged children and adolescents. Teacher support refers to ongoing warmth and trust, united with open communication, instructional support, and positive involvement in students' overall well-being (Reddy, Rhodes, & Mulhall, 2003; Wang, 2009). A low level of teacher support among youth is consistently associated with a high level of youth depressive symptoms. For example, in a longitudinal sample of 2,585 U.S. students who were followed from Grade 6 to Grade 8, Reddy and colleagues (2003) found that students who reported decreasing levels of teacher support had corresponding increases in depressive symptoms. Further, in a cross-sectional study of a nationally representative adolescent sample from Grade 7 to Grade 12, Joyce and Early (2014) found that youth with lower perceptions of teacher support had more depressive symptoms. Moreover, besides poorer psychological adjustment, Way, Reddy, and Rhodes (2007) and Wang (2009) have demonstrated that less perceived support from teachers led to more disruptive behaviors in the classroom.

Among Chinese youth, the significant contribution of teacher support to youth's emotional health is well supported. In a sample of rural adolescents aged 13 to 16 years, Davidson and Adams (2013) found that among youth who experienced cumulative adversities in rural villages, teacher support buffered the impact of poverty-related risk factors on internalizing problems. Similarly, in a study of 221 urban adolescents, teacher support was the most significant predictor of positive psychological functioning in Chinese youth (Tian, Liu, Huang, & Huebner, 2013). Particularly for rural left-behind children (those who stay at home when both of their parents relocate to cities to work), social support from teachers predicted fewer depressive symptoms (He et al., 2012) and problem behaviors (Liu, Li, Chen, & Qu, 2015).

Perceived School Connectedness and Youth Depressive Symptoms

Greater school connectedness among children and adolescents is consistently linked with better psychological outcomes. School connectedness refers to the extent to which students feel included, respected, valued, cared for, and supported by others in the school context (Joyce & Early, 2014; Libbey, 2004; Shochet, Dadds, Ham, & Montague, 2006). Using data from the U.S.

National Longitudinal Study of Adolescent Health, two cross-sectional studies employing multilevel modeling found that students' higher levels of school connectedness correlated to lower levels of depressive symptoms (Anderman, 2002; Joyce & Early, 2014). Additionally, prospective studies in the United States have demonstrated that a lower level of school connectedness was predictive of future depressive symptoms. For example, in a sample of 2,022 students aged 12 to 14 years, school connectedness associated strongly with concurrent depressive symptoms and predicted depressive symptoms one year later (Shochet et al., 2006). In another study of 460 children and adolescents in Grades 6 and 7, Kuperminc and colleagues (2001) found perceptions of school climate (i.e., fairness, order, and discipline; sharing of resources; and student interpersonal relationships) accounted for 2% of the variance in anxious-depressed symptoms and 7% in behavioral problems at the 12-month follow-up.

In the Chinese context, there is little research on the relationship between school connectedness and depressive symptoms in children and adolescents. However, the available research suggests a strong link between school connectedness and adolescent depression; for example, in a study that examined Chinese adolescents in the 11th grade, Zhao and Zhao (2015) found that perceived school connectedness was negatively correlated with depressive symptoms, and mediated the effect of emotional regulation on depressive symptoms.

School SES and Youth Depressive Symptoms

Although depressive symptoms have been found to be associated with low family SES (Wickrama, Noh, & Elder, 2009) and low community SES (Wight, Botticello, & Aneshensel, 2006), a small number of studies have assessed the role of school-level SES on youth's mental health. Overall, the limited research on the association between school SES and youth depressive symptoms reveals a mixed picture. For example, in a cross-sectional sample of 13,235 adolescents with an average age of 15.9 years, Goodman, Huang, Wade, and Kahn (2003) found low school-level family income predicted a high level of depressive symptoms after controlling for individual-level family income. However, in another study examining longitudinal changes in depressive symptoms, school-level aggregated family poverty was not found to have a significant effect on the trajectories of depressive symptoms from adolescence to young adulthood (Wickrama & Vazsonyi, 2011). Similarly, Dunn, Milliren, Evans, Subramanian, and Richmond (2015) found that school-level SES, calculated as the mean of standardized measures of school-level poverty, school-level parental occupation, and school-level percentage of Whites, was not significantly related to youth depressive symptoms. These mixed findings might be attributed to different operationalizations of school SES.

In the Chinese context, there were no studies that directly examined the relationship between school SES and youth depressive symptoms. However, studies showed that youth living in rural communities (who are very likely to be in resource-constrained schools), had higher rates of internalizing symptoms compared with those in urban communities (Fan, Zhang, Yang, Mo, & Liu, 2011; Hesketh & Ding, 2005). Similarly, Davidson and Adams (2013) found rural poverty

affected every aspect of youth's lives (e.g., parent migration and academic struggles), which further trapped them in adversity. In another multiwave study on urban and rural adolescents from Hunan Province of China, Cohen and colleagues (2014) found that rural Chinese adolescents experienced increased levels of anxiety symptoms, but showed no significant difference with regard to depressive symptoms. As school setting is an important ecological entity that parallels family and neighborhood, it might be important to examine the association between school factors and youth mental health.

The Current Study

Grounded in Bronfenbrenner's ecological system theory (1979), the current study aims to fill gaps in the social determinants literature by examining the influence of school factors on depressive symptoms in a little-studied population: urban and rural youth residing in Northwest China. According to Bronfenbrenner, human development is a dynamic process influenced by innate characteristics and life experiences. Bronfenbrenner's theory embraces the person-in-environment perspective by focusing on the individual and the context in which the individual functions. According to Bronfenbrenner, youth development is strongly influenced by the family, school, and community contexts in which they live and interact.

This study takes account of the nested nature of the data (individuals nested in schools), and applies a multilevel statistical approach to model the effects of individual and school factors simultaneously on youth depressive symptoms. Individual perceived school experiences are considered level-1 predictors; school characteristics are considered level-2 predictors.

The objective of this cross-sectional study is to understand the unique influence of student-perceived teacher support, student-perceived school connectedness, and school-level SES on depressive symptoms among children and adolescents. Also, the current study investigates the extent of the association between school-level SES and depressive symptoms varied for individual-level perceived teacher support and school connectedness. Specifically, the following hypotheses were tested:

- Hypothesis 1: A higher level of student-perceived teacher support, student-perceived school connectedness, and school-level SES will predict a lower level of youth depressive symptoms.
- Hypothesis 2: The association between school-level SES and youth depressive symptoms will vary for youth with different perceived levels of teacher support, such that among students in low SES schools, the protective effect of teacher support will be stronger compared with those in high SES schools.
- Hypothesis 3: The association between school-level SES and youth depressive symptoms will vary for youth with different levels of school connectedness, such that among students in low SES schools, the protective effect of school connectedness will be stronger compared with those in high SES schools.

Methods

Sampling Procedure and Participants

Three-stage stratified and random cluster sampling was used to recruit youth participants from 10 primary schools in a mid-sized city and surrounding area located in Northwest China. The sample was stratified first by region (urban vs. rural districts) and then by school type (key vs. ordinary schools, the two main types of public school in China). Compared to ordinary schools, key schools usually have higher quality teachers, better facilities, and more academically advanced students. Most of them are located in urban areas. At the third stage, two Grade 6 classes in each school were randomly cluster sampled.

Approvals from a review board in China and the 10 school committees were obtained before conducting the study. Students were recruited through a letter that was sent to the parent-teacher conference of the selected classes. Families who were interested in participating were asked to sign and return a consent form. The students whose parents had consented to participate and who were willing to participate themselves completed a questionnaire during the school day. After a brief introduction of this research project by the author and research assistants, student respondents were asked to complete the questionnaires by themselves and were assured of the confidentiality of their responses. As students completed the paper-and-pencil self-report measures, the research assistants were present to answer questions. Sampled students were surveyed on demographic information, personality characteristics, family and school experiences, and psychological functioning. All responses were identifiable only by participant number.

A total of 881 sixth-grade students participated in this study, with a response rate of 97%. The study sample was fairly evenly divided between urban (51%) and rural (49%) schools. Reflecting the proportion of key schools in this area, 34% of sampled students were in key schools, whereas 66% were in ordinary schools. Among the participants, 400 were girls and 481 were boys, with a mean age of 11.59 years. The majority were the only child (71%) in a two-parent family (86%). The mean monthly family income was 6,501 RMB (approximately 980 USD). Forty-five percent of either the father or mother of student respondents had less than nine years schooling. Fifty-three percent of either the father or mother of sampled students held low-skilled occupations, such as waitress, cleaner, or construction worker. Since the missing data were few (less than 1% of responses) and were missing at random, listwise deletion was used to treat the missing data, as it outperforms the imputation method when less than 30% of data are missing (Kromrey & Hines, 1994).

Measures

Child depressive symptoms. The primary outcome variable, child depressive symptoms, was measured by the Children's Depression Inventory (CDI; Kovacs, 1992). The CDI consists of 27 items designed to measure a variety of symptoms of depression, such as sleep disturbance, appetite loss, suicidal thoughts, and general dysphoria; it is not a diagnostic instrument of clinical

depression. Each item consists of three statements that describe a range of possibilities, from normal responses (0), to indications of moderate depressive symptoms (1), to severe depressive symptoms (2). The instrument has been widely used in many Western countries and has been found to be reliable and valid in the Chinese version (Yu & Seligman, 2002; He et al., 2012). The Cronbach's alpha measured in this study is .86.

Student-perceived teacher support. The level-1 predictor, perceived teacher support, was measured by the subscale of the Child and Adolescent Social Support Scale (CASSS; Malecki & Demary, 2002). The 12-item subscale covers youths' perceptions regarding emotional, informational, appraisal, and instrumental support from teachers, with a Cronbach's alpha of .89. Although the CASSS was originally developed from a sample of Western youths, it has shown good psychometric properties among Chinese child and adolescent populations (Chen & Wei, 2013; Liu, Mei, Tian, & Huebner, 2016). The sampled students responded on a 6-point Likert scale, from 1 (*never*) to 6 (*always*), reflecting the degree to which respondents perceived teachers as attentive, encouraging, caring, and interested in them. Sample items include: "If I study hard, my teacher will praise me", and "My teacher helps me solve problems by giving me information".

Student-perceived school connectedness. The level-1 predictor, perceived school connectedness, was measured by the Psychological Sense of School Membership Scale (PSSM; Goodenow, 1993). The PSSM has been widely examined in the Chinese context, and has demonstrated good reliability and validity (Bao & Xu, 2006; Cheung, 2004; Cheung & Hui, 2003; Pan, Wang, Song, Ding, & Dai, 2011). This 18-item measure with a 5-point Likert-type response scale from 1 (*not at all true*) to 5 (*completely true*) comprises items such as "I feel like a real part of this school", "People here know I can do good work", and "I am included in lots of activities at this school". Cronbach's alpha in the present study was .88.

School SES. This composite measure, the level-2 predictor, was calculated as the mean of standardized (z-score) measures of aggregated household income, aggregated parental education, and aggregated parental occupation with higher values representing higher levels of school SES (Cronbach's alpha = .81). The calculation of the school SES composite variable followed the standardization process used by Duncan and Aber (1997). First, the mean and standard deviation for each variable in the composite variable was calculated using data from observations included in the sample. Second, because the three variables included in this composite measure were not originally measured on the same scale, z-scores were created for each student for each variable included in the composite. Third, the z-scores for each variable included in the composite were averaged into a final composite score. Importantly, the composite measure of school SES used the same variables as the family SES to provide consistency across SES measures.

Control variables. Individual-level covariates included the age of the respondent as a continuous variable, and gender as dichotomous (boy = 0, girl = 1). Family cohesion was measured by the six items on parental behaviors and interactions with children in the family setting created by Yi, Wu, Chang, and Chang (2009); each item was rated on a 4-point Likert scale, from 1

(*disagree*) to 4 (*agree*), with higher scores represents higher level of family cohesion. The Cronbach’s alpha of the family cohesion scale was .87. Individual-level family structure (single parent = 0, not single parent = 1), sibling presence (single child = 0, non-single child = 1), and family SES (a composite measure of family income, parental education, and parental occupation) were also controlled. School-level covariates included school type (ordinary = 0, key = 1) and school urbanicity (rural = 0, urban = 1).

Analytic approach

Given the need to model individual and contextual characteristics simultaneously, the author employed a 2-level hierarchical linear model (HLM) to take into consideration the fact that individuals were nested within schools. The 2-level HLM approach made it possible to examine the influence of individual and school variables on depressive symptoms of rural and urban Chinese children and adolescents.

Adhering to the procedure that Raudenbush and Bryk (2002) recommended for HLM analyses, a total of five 2-level hierarchical linear models were estimated. To determine the best fitting model, Proc Mixed in SAS v9.4 with Maximum Likelihood (ML) estimation and a between-within degrees of freedom approximation was used. The estimated coefficients associated with each of the main effects indicate whether the predictors of interest are associated with depressive symptoms and whether the interactions are significant, net of other control variables in the model. The final model for the outcome variables is:

$$\begin{aligned} \text{DEPRESSsymptoms}_{ij} = & \gamma_{00} + \gamma_{10}SPTS_{ij} + \gamma_{20}SPSC_{ij} + \gamma_{30}Age_{ij} + \\ & \gamma_{40}Gender_{ij} + \gamma_{50}Fcohesion_{ij} + \gamma_{60}Fstructure_{ij} + \gamma_{70}Csingle_{ij} + \gamma_{80}FSES_{ij} \\ & + \gamma_{01}SSES_j + \gamma_{02}Stype_j + \gamma_{03}Surban_j + \gamma_{11}SPTS_{ij} * SSES_j + \gamma_{21}SPSC_{ij} * \\ & SSES_j + \mu_j + e_{ij} \end{aligned}$$

where $\text{DEPRESSsymptoms}_{ij}$ is the depressive symptoms score for student i in school j . γ_{00} represents the estimated average depressive symptoms scores in the population when all variables are set to zero. The regression parameters γ_{10} through γ_{80} are associated with individual-level independent variables and covariates: student-perceived teacher support, student-perceived school connectedness, age, gender, family cohesion, family structure, sibling presence, and family SES. The regression parameters γ_{01} through γ_{03} reflect the effects of the school-level predictor and controlled correlates — school SES, school type, and school urbanicity — on youth depressive symptoms. The cross-level interaction, γ_{11} , represents the moderating effect of perceived teacher support on school SES. Similarly, another cross-level interaction, γ_{21} , represents the moderating effect of perceived school connectedness on school SES. The random effect, μ_j , represents the common unobserved characteristics that distinguish school j . The residual, e_{ij} , is the unique error term associated with student i in school j .

To determine the proportion of total variance explained by school differences — the intraclass correlation (ICC) — a fully unconditional model with no predictors included (Model 1) was tested. With 18.6% of the total variance in youth depressive symptoms residing between schools, and 81.4% within schools, these results indicated that proceeding with a multilevel HLM analysis is appropriate and preferred over traditional regression models. As suggested by Raudenbush and Bryk (2002), the decision to proceed with a multilevel analysis depends partly on the extent of between-group variation compared with within-group variation.

To answer the research questions, the author then estimated a level-1 model (Model 2) with student-perceived teacher support and school connectedness as level-1 predictors; a main effect model (Model 3) including both level-1 and level-2 predictors for the first research question; a cross-level interaction model (perceived teacher support * school SES) for the second research question (Model 4a); and another cross-level interaction model (perceived school connectedness * school SES) for the third research question (Model 4b). All models were estimated as random intercept models. Parameter estimates and fit statistics for the five models are presented in Table 2.

To determine if changes in model fit were significant, the -2 Log Likelihood (-2LL) and applied chi-squared likelihood ratio tests were examined. This revealed that Model 4a was the best-fitting fixed-effects model. All continuous predictor variables without a meaningful interpretation of zero were grand-mean centered. To test model assumptions, the author ran the MIXED_DX macro in SAS Proc Mixed (Bell, Schoeneberger, Morgan, Ferron, & Kromrey, 2010) to examine residuals for violations of distributional assumptions at both of levels 1 and 2, and no violations were detected.

Results

Descriptive Statistics

Descriptive statistics for participants and bivariate correlations among the key study variables and controlled correlates are presented in Table 1. The mean CDI score in the sample was 23.57. In regard to clinical significance, 21.4% of the sample had a CDI score equal to or above the cutoff point of 19 (Kovacs, 1992). This finding is consistent with previous studies among children and adolescents in other areas of China (Chan, 2012; Wang et al., 2015). The bivariate analyses demonstrated that being male, better family cohesion, being a single child, and better family SES predicted fewer symptoms. Importantly, the key study variables, student-perceived teacher support, student-perceived school connectedness, and school SES, were associated with youth depressive symptoms. Both individual-level perceived teacher support ($r = -.17, p < .001$) and school connectedness ($r = -.13, p < .001$) were negatively associated with youth depressive symptoms, suggesting that teacher support and school connectedness are protective factors for youth emotional disorder. Further, school-level SES was negatively associated with depressive outcomes ($r = -.11, p < .001$), indicating that low school SES is a significant risk factor for depression.

Table 1 *Descriptive Statistics and Correlations for All Variables (n = 881)*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Depressive Symptoms	23.57	2.24	-											
2. Child Age	11.59	1.07	-.04	-										
3. Child Gender	.45	.50	-.07*	.01	-									
4. Family Cohesion	13.24	1.51	-.18*	.02	.01	-								
5. Family Structure	.86	.42	.03	.01	.01	.23*	-							
6. Single child	.71	.48	.10*	.01	.09*	.03	.03	-						
7. Family SES	9.54	.95	-.07*	.03	.02	.02	.26*	-.06*	-					
8. Perceived Teacher Support	43.88	4.76	-.17*	-.15*	.05*	-.02	.02	.01	.07*	-				
9. Perceived School Connectedness	49.93	6.61	-.13*	-.03	.01	.01	.02	.01	.05*	.14*	-			
10. School SES	7.16	1.39	-.11*	.01	.01	.03	.04	.06*	.28*	.07*	.05*	-		
11. School Type	.30	.48	.01	.002	.01	.03	.01	.02	.21*	.04	.04	.20*	-	
12. School Urbanicity	.50	.53	.01	.01	.01	.01	.03	-.09*	.07*	.04	.04	.11*	.04	-

Two-level Hierarchical Linear Models

Table 2 presents the results of the random intercept effects of the HLMs. Model 1 indicated that youth depressive symptoms scores varied across schools, with about 18.6% variation to be explained by school-level characteristics. Model 2 showed that youth depressive symptoms varied in individual age ($b = -.26; p < .001$) and gender ($b = -.89; p < .001$) when between-school variation was partialled out. Results showed that younger participants and male participants were more likely to report higher depressive symptoms scores. While family structure was not correlated with the outcome variable ($b = .03, p > .05$), better family cohesion and having no siblings were associated with fewer depressive symptoms ($b = -.20, p < .001; b = .12, p < .001$, respectively). Importantly, teacher support ($b = -.19, p < .001$) and school connectedness ($b = -.16, p < .001$) were significantly associated with depressive symptoms. Model 3 is the main effect model that contained the level-1 and level-2 predictors and covariates simultaneously. The model showed school SES correlated negatively with youth psychological outcome when controlling for level-1 variables ($b = -.35, p < .05$). The results from Model 2 and Model 3 supported Hypothesis 1, showing significantly negative associations between teacher support, school connectedness, school SES, and depressive symptoms. Model 4a included cross-level interaction between perceived teacher support and school SES ($b = .67, p < .05$), which was statistically significant, indicating that the relationship between school-level SES and youth psychological outcome varied by individual-level teacher support. Model 4b included another cross-level interaction between perceived school connectedness and school SES ($b = .54, p < .05$), which was also significant, meaning the relationship between school SES and youth psychological outcome did vary by individual-level school connectedness.

Table 2 Parameter Estimates for Internalizing Problems Models and Models of Interest (n=881)

Fixed effects	Model 1	Model 2 Intercept Random	Model 3 (RQ1) Intercept Random	Model 4a ¹ (RQ2) Intercept Random	Model 4b (RQ3) Intercept Random
Intercept	20.66* (.31)	23.21* (1.47)	23.29* (1.47)	23.93* (1.47)	23.93* (1.47)
Child age (centered)		-.25* (.09)	-.25* (.09)	-.26* (.09)	-.25* (.09)
Child gender		-.89* (.28)	-.88* (.28)	-.89* (.27)	-.88* (.28)
Family cohesion (centered)		-.21* (.02)	-.20* (.02)	-.20* (.02)	-.20* (.02)
Family structure		.03 (.07)	.04 (.07)	.03 (.08)	.03 (.07)
Single child		.12* (.08)	.12* (.08)	.12* (.09)	.12* (.08)
Family SES		-.03 (.02)	-.03 (.02)	-.03 (.02)	-.03 (.02)
Perceived teacher support (centered)		-.19* (.24)	-.18* (.24)	-.19* (.24)	-.18* (.24)
Perceived school connectedness (centered)		-.15* (.18)	-.16* (.18)	-.16* (.18)	-.16* (.18)
School SES			-.34* (.20)	-.35* (.20)	-.34* (.20)
School type			.03 (.04)	.03 (.03)	.03 (.04)
School urbanicity			.02 (.07)	.02 (.07)	.02 (.07)
Perceived teacher support*school SES				-.08* (.02)	
Perceived school connectedness*school SES					-.06* (.02)
Model Fit -2LL	5858.7	5695.5	5678.1	5673.3	5674.5
Error Variance					
Level-1	35.84* (1.46)	32.00* (1.39)	31.99* (1.39)	31.89* (1.39)	31.90* (1.39)
Intercept (School)	8.17* (1.14)	6.78* (1.08)	6.33* (1.06)	7.13* (1.06)	6.98* (1.06)

Note: * $p < .05$; ICC = .186; Estimation Method=ML; between within degrees of freedom; Entries show parameter estimates with standard errors in parentheses.

¹Best fitting model

Figure 1 illustrates an interaction effect, the association between youth depressive symptoms and school SES as a function of individual perceived teacher support. Figure 2 illustrates another interaction effect, the association between youth depressive symptoms and school SES as a function of individual perceived school connectedness.

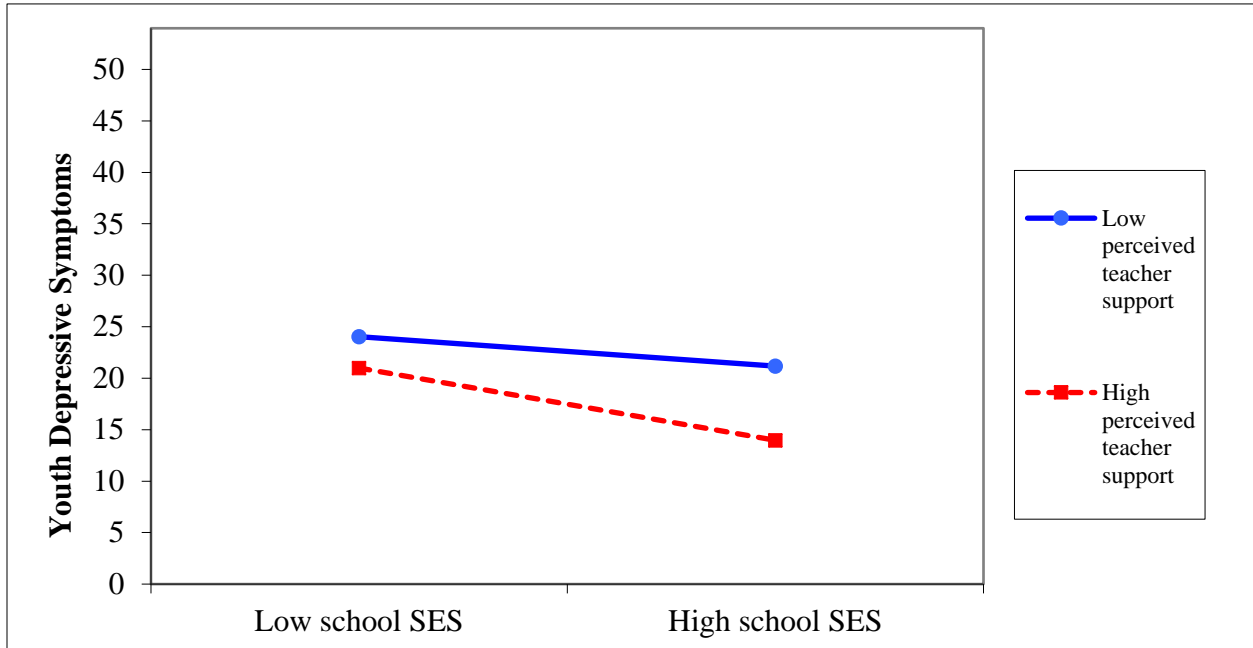


Figure 1. The effect of perceived teacher support on the association between school SES and youth depressive symptoms.

In Figure 1, the predicted depressive symptoms score is plotted against school-level SES separately for low and high levels of teacher support. As shown, the interaction between individual-level perceived teacher support and school SES was significant in predicting youth depressive symptoms. Overall, a high level of teacher support protected youth from depressive symptoms. Further, the association between school SES and depressive outcome varied with the level of teacher support. As depicted in Figure 1, the effect of school SES on depressive symptoms was larger among students perceiving a higher level of teacher support. Counter to Hypothesis 2, the protective effect of teacher support is stronger for youth in high SES schools compared with those in low SES schools. That is, for students from low SES schools, the effect of teacher support on depressive symptoms was weaker.

Similarly, Figure 2 plots the predicted depressive symptoms scores against school SES separately for low and high levels of school connectedness. Generally, for an average student in a school with average SES, a higher level of school connectedness was related to lower scores on the scale of depressive symptoms. As depicted in Figure 2, the interaction effect between student-perceived school connectedness and school SES was significant in predicting youth depressive symptoms. School connectedness moderated the negative association between school SES and youth depressive symptoms. This association was significantly stronger among students with high

school connectedness, but much weaker among students with low school connectedness, which rejected Hypothesis 3. Thus, the hypothesized stronger protective effect of school connectedness for students in low SES schools was not supported.

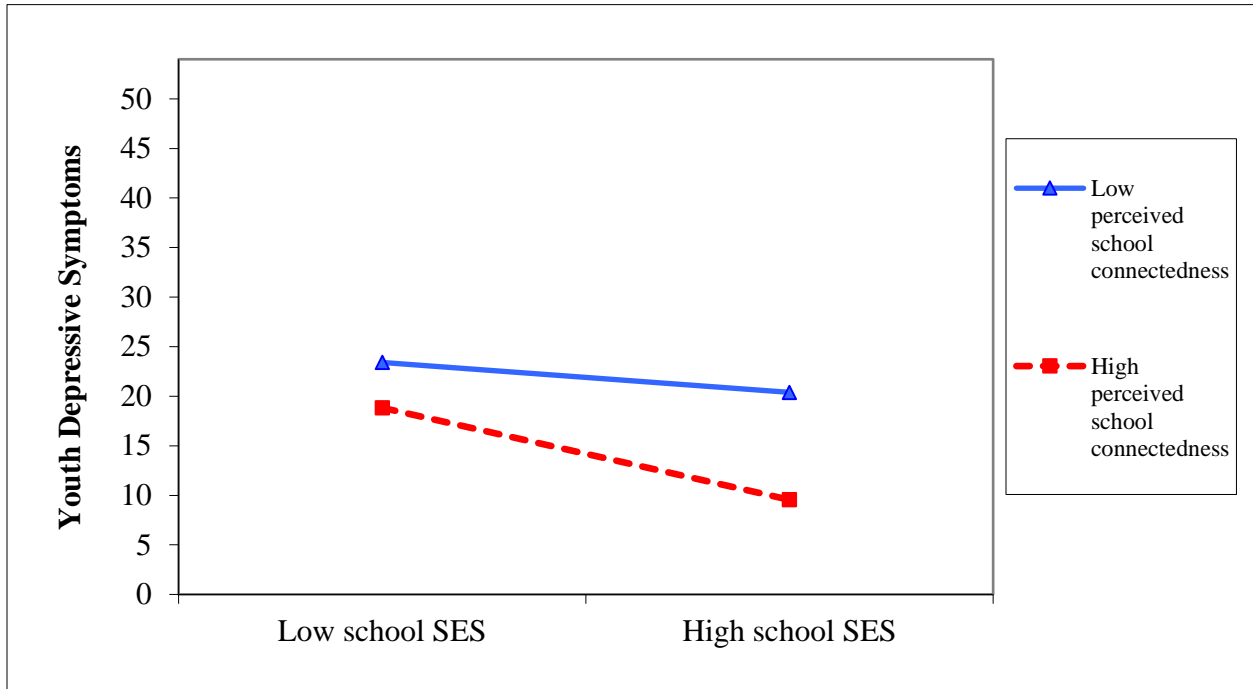


Figure 2. The effect of perceived school connectedness on the association between school SES and youth depressive symptoms.

Discussion

As expected, higher perceptions of teacher support and school connectedness were associated with fewer depressive symptoms, offering preliminary support for the impact of positive school experiences on youth psychological adjustment in Northwestern China. The results echo findings from previous research done in the United States (Joyce & Early, 2014; Reddy et al., 2003) and other areas in China (Davidson & Adams, 2013; Zhao & Zhao, 2015).

A major contribution of the current study is to establish school SES as a valuable predictor of depressive symptoms among Chinese youth. This finding adds to the current literature by relating school SES to a reliable and validated Chinese-version measure of child depressive symptoms. While years of research have established that the SES of a youth's family and community is vitally linked to the youth's mental health (Wickrama et al., 2009; Wight et al., 2006), school SES has been largely overlooked in the literature as an important resilience/risk factor, particularly in the Chinese context. In the last three decades, along with the economic boom in China, the urban–rural economic gap has widened rapidly. Many schools in rural areas are resource-constrained, and as a result, students often experience low-quality instruction, high teacher turnover, and a disordered physical environment (Davidson & Adams, 2013; Sargent &

Hannum, 2009), potentially harming their mental health. Future research should examine the relationship between low school SES and myriad aspects of children's socioemotional and educational development.

This study also examined whether the relationship between school SES and youth depressive symptoms varied with perceived teacher support. Beyond its independent benefit (Davidson & Adams, 2013; Reddy et al., 2003), perceived teacher support appeared to play an interactive role with school SES. Because students in this sample had spent a great deal of time with teachers, due to long school days and long academic years (Adams & Hannum, 2016), the author originally hypothesized that students in low SES schools would gain more benefit from teacher support. The findings suggest, however, that the association between teacher support and youth depressive symptoms is stronger in high SES schools. One explanation for this finding is that youth in economically well-off schools might be better able to perceive and respond to teacher support (Cohen et al., 2014; Ding, 2006). For example, academic anxiety is prevalent among students from low SES schools who have not benefited equally from educational resources in China (Ding, 2006), which might make students less likely to perceive and respond to teacher support. The results underscore that teacher support is important for reducing depressive symptoms among the sampled youth in Northwest China. This is true for both low and high school SES, but the effect is greater when school SES is high.

In the current study, the relationship between school SES and depressive symptoms did vary significantly for students with different perceptions of school connectedness. For students both in low and high SES schools, higher perception of school connectedness was associated with fewer symptoms. However, counter to the third hypothesis, results showed that school connectedness has a stronger protective effect for youth in high SES schools than for those in low SES schools, similar to the moderating role of teacher support. One possible explanation for these findings could be that high SES is significantly related to urban key schools that commonly have enriched curriculums and activities, and adequate teacher training (Sargent & Hannum, 2009), which may promote school connectedness among students. Another explanation could be that for the overwhelming majority of sampled students in high SES schools, both parents work; as a result, students in these schools might not receive sufficient supervision and emotional support from parents. Thus connectedness with schools, support from teachers, and other positive school experiences could be more important for the mental health of these children than of those in low SES schools who have at least one parent available at home. Future research is needed to better understand why this might be the case. It has been noted that children and adolescents in economically disadvantaged schools are at increased risk of experiencing a negative educational climate, including poor teacher quality, harsher discipline, and peer delinquency (Davidson & Adams, 2013; Hannum & Park, 2002). Such negative experiences could accumulate and ultimately result in poorer mental health.

Although it is not the focus of this study, it is noteworthy that gender effects on Chinese youth depressive symptoms differ from the effects reported in U.S. literature. A large number of

studies on U.S. youth found that girls reported greater severity as well as more rapid development of depressive symptoms (Ge, Conger, & Elder, 2001; Kessler et al., 2012). In contrast to the research conducted with American youth, our study found that boys reported higher scores on the measure of depressive symptoms. This unexpected finding might be attributed to son preference in Chinese culture. Parents pin great hopes on their sons, and often use stricter parenting with them than with their daughters, which could contribute to deterioration in the sons' psychological functioning. This is especially true for boys from economically deprived families, who often receive the majority of household resources to stay in school, and are expected to become academically outstanding in order to bring the whole family out of poverty eventually. Thus, it is possible that boys who struggle with academics might be more depressed than girls who face similar academic hardships. Future research is needed to explore the relationships between parenting, academic performance, and gender difference in depressive symptoms among Chinese children and adolescents.

Limitations

Although the current study contributes to the literature by enriching our understanding of positive school experiences on youth mental health, a number of limitations should be considered when interpreting the study findings. First, self-report measures were used to examine depressive symptoms, teacher support, and school connectedness. With regard to depressive symptoms and other constructs, while self-report measures used in the present study possess high levels of reliability and validity, the use of more sophisticated and comprehensive methods of assessment, such as clinical interviews and information from multiple informants (parents and teachers), should be utilized in future studies. Second, the cross-sectional nature of this study does not allow eliminating alternative explanations for the proposed causal relationships. This highlights the need for prospective studies to establish the causal direction between the key predictors and the criterion variable. Lastly, the findings of this study were limited to a small number of sixth grade children in one city and its surrounding areas in China. Their generalizability to youth in other areas of China and other countries is thus limited.

Conclusion

This pilot study serves as a basis for continuing studies in understanding how school factors predict youth mental health in both wealthy urban and disadvantaged rural areas. Given the prevailing emphasis on education in China, the school setting is particularly critical to the development of Chinese youth. Further, school is often the primary setting for mental health education, prevention, and intervention in China. Future research on the relationship between teacher support, school connectedness, school SES, and Chinese youth depressive symptoms is warranted, particularly among those in rural resource-constrained schools. Ultimately, understanding the effects of teacher support and school connectedness might lead to opportunities for developing and implementing efforts to support youth psychological functioning within the school context.

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