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Perceived Social Support and School Well-Being Among Chinese Early and Middle Adolescents: The Mediational Role of Self-Esteem

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Abstract This study examined the mediational role of self-esteem in accounting for the empirical link between perceived social support (parents, friends, and teachers) and school well-being (school satisfaction, positive affect in school, and negative affect in school). Participants were from China and were 221 early adolescents (Mage = 13.6) and 140 middle adolescents (Mage = 16.4). Among early adolescents, parent and teacher support, but not friend support, related significantly to positive school well-being. Among middle adolescents, friend and teacher support, but not parent support, significantly related to school well-being. For both early and middle adolescents, global self-esteem mediated relations between teacher support and school well-being. For early adolescents, global self-esteem mediated relations between parent support and school well-being; whereas for middle adolescents, global self-esteem mediated relations between friend support and school well-being. The findings supported socialcognitive models of well-being in Chinese context. Implications are discussed in the context of developmental and cultural considerations.

Keywords School well-being · Early adolescents · Middle adolescents · Perceived social support · Self-esteem

1 Introduction

Adolescents' evaluations of their school experiences have garnered attention from governments, professionals, and scholars in different parts of the world. A growing number of psychologists (Baker 1998; Epstein and McPartland 1976; Huebner and McCullough 2000; Karatzias et al. 2001a, b; Konu and Lintonen 2006; Randolph et al. 2010) have discussed the conceptualization, measurement, and applications of school-related well-being

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measures as well as the network of related concepts. Nevertheless, the majority of studies have been conducted with students from Western cultural backgrounds. Few studies have been conducted with students from Eastern backgrounds, such as Chinese students (Hui and Sun 2010; Tao et al. 2005; Tian and Liu 2007). Therefore, the current study explored the school well-being of Chinese adolescents to assess the generalizability of findings derived primarily from research with USA and European school children.

1.1 School Well-Being

Studies of child and adolescent subjective well-being have predominantly focused on global or overall well-being. A variety of conceptualizations of global subjective well-being have been proposed, however, the most widely accepted model has been proposed by Diener (1984). Based on work with adults, global subjective well-being is defined by Diener as a multidimensional construct that includes positive affect (i.e., frequent positive emotions, such as joy), negative affect (i.e., infrequent negative emotions, such as anxiety) and a cognitive judgment of the quality of life overall (i.e., global life satisfaction) and/or with specific domains (e.g., family, school). Thus, a person with high overall subjective well-being experiences frequent positive emotions, infrequent negative emotions, and a high level of global and domain-specific life satisfaction. This model has been extended to children and adolescents (e.g., Huebner and Dew 1996).

Taking a domain-specific approach to well-being, Tian (2008) has proposed a model for studying children's experiences, particularly in the school context (i.e., school well-being). Tian conceptualized *school* well-being as emerging from the interactions among students' school satisfaction, positive affect in school, and negative affect in school. School satisfaction refers to a global cognitive evaluation of school life, which emerges from a student's day-to-day school experiences. Positive affect in school refers to the frequency of positive emotions experienced specially during in school, such as feeling relaxed, pleasant, or happy. Negative affect in school refers to the frequency of negative emotions, such as feeling depressed, upset, or bored. Empirical support for this school well-being model has been garnered with Chinese adolescents (Tian 2008; Tian and Liu 2007).

School satisfaction, as a major component of school well-being, has previously received attention from scholars (e.g., Baker et al. 2003; Huebner et al. 2001). Studies have examined various presumed antecedents of school-age students' school satisfaction, including demographic variables (e.g., gender, grade; Karatzias et al. 2001a, b), individual variables (e.g., personality; Karatzias et al. 2002), objective environmental variables (e.g., school regulations, infrastructure, teacher gender, class size; Engels et al. 2004; Randolph et al. 2010; Zullig et al. 2011), and subjective environmental variables (e.g., perceived social support; DeSantis-King et al. 2006). However, the results of these previous studies have been mixed. For example, some research has shown that adolescents' school satisfaction decreases with grade (Karatzias et al. 2001a, b; Okun et al. 1990), whereas other research has not found this relationship (Huebner et al. 2001). Furthermore, some studies from different cultural settings have demonstrated that adolescents' school satisfaction is closely related to social support from parents, teachers and classmates (e.g., DeSantis-King et al. 2006; Hui and Sun 2010), however, the psychosocial mechanisms accounting for the relationships among these variables remain unclear. Other factors may influence the nature or magnitude of the relationship, such as students' achievement level (Stewart and Suldo 2011), ethnicity (Vedder et al. 2005), and age. For example, the strength of the relationships between the various sources of social support and school well-being appears to vary as a function of age in some cultures (Bokhorst et al. 2010; Stewart and Suldo 2011).

Therefore, based on the previous research, the current study will investigate further the linkages between social support (parent, teacher, friend) and multiple domains of school well-being (school satisfaction, positive affect in school, negative affect in school), taking the students' age into account (early adolescence, middle adolescence).

1.2 Relations Among Social Support, School Well-Being and Age

Deci and Ryan's (1985) Self-determination Theory theorizes that children's well-being is determined by the satisfaction of three fundamental psychological needs: competence, autonomy, and relatedness. Connell and Wellborn (1991) further proposed a model of self-system processes, which were defined as appraisals of self, which mediate the relationship between the three basic needs and children's well-being and outcomes. According to applications of the self-system processes theory to the school environment (Connell and Wellborn 1991), students' evaluations of their school experiences reflect, in a sense, the extent to which school experiences satisfy basic psychological needs, including needs for competence, autonomy, and relatedness. Connell (1990) defined the "need for relatedness" as the need to feel securely connected to and valued by other persons in the environment. Furthermore, his theory posits that the need for relatedness is influenced by social support. Thus, the experience of social support from important others in school should relate positively to students' school well-being, including school satisfaction and positive and negative affect in school.

Studies with children and adolescents have supported robust relations between students' school well-being and perceived social support, including parent support (Rosenfeld et al. 2000), friend support (Epstein 1981; Epstein and McPartland 1976), and teacher support (Baker 1999; Epstein 1981; Rosenfeld et al. 2000). Furthermore, several studies (Danielsen et al. 2009; DeSantis-King et al. 2006; Ito and Smith 2006; Suldo et al. 2008) found differences in the magnitude of the associations between social support and well-being as a function of the source of social support, with support from teachers showing the strongest association with students' well-being, when all three sources of support (parents, peers, and teachers) were measured simultaneously via self-report. Other studies have supported the importance of parental support in various child and adolescent developmental outcomes (e.g., see Ainsworth et al. 1978), however, some studies have found that relationships between family and friends can also be sources of conflicts (Barrera et al. 1993; Rook 1984). These conflicts might lessen the effects of family and friend support on well-being. Such studies suggested that it is necessary to differentiate the various sources of social support when investigating students' school well-being, social support, and the mechanisms that may account for the relations among them.

Additional studies suggest that adolescents' needs for support from parents and friends changes across the age span (Proctor et al. 2009), particularly during the critical period of early adolescence (Nickerson and Nagle 2004). Relative to the childhood years, relationships with friends begin to exert a greater impact on students' global life satisfaction during adolescence (Nickerson and Nagle 2004), although relationships with parents remain critical during adolescence (Ma and Huebner 2008). However, during middle adolescence, friendship with peers begins to increase in importance in adolescents' lives, perhaps related to their growing need for independence from their parents (Keijsers et al. 2010). Hence, the nature and influence of students' perceptions of various social supports likely vary across age level. We speculated that the relative contributions of parent and peer relationships to students' school well-being change as children mature, with peer relationships assuming greater importance among middle adolescents than among early adolescents. Therefore,

this study took students' age into account (early adolescence, 12–14 years old versus middle adolescence, 15–17 years old) when investigating the effects of social support on school well-being.

1.3 Mediation Models of Self-Esteem

Generally, social-cognitive models of subjective well-being hypothesize that the relationships between environmental experiences, such as social relationships and subjective well-being are mediated by cognitive variables, such as self-esteem or self-worth (Lent et al. 2005). More specifically, Harter (1987) found support for a model in which global self-worth mediated the relation between social support and children's characteristic moods. Similar findings have been obtained by others (e.g., Rosenberg et al. 1995; Yarcheski et al. 2001), including studies of Chinese college students (Yan and Zheng 2006) and primary school students (Hui and Sun 2010). It should be noted that most studies have focused primarily on the mediational role of self-esteem or self-worth on general social support and well-being, with few studies investigating the differential contributions of various specific sources of social support to school well-being.

1.4 Study Purpose

This study examined the interrelations among social support from parents, teachers, and friends, global self-esteem, and domain-specific *school* well-being among early and middle adolescents from China. Specifically, we formulated three hypotheses: (a) school well-being reports of middle adolescent students will be significantly lower than those of early adolescent students; (b) teacher support and parent support will be the most significant predictors of individual differences in school well-being in early adolescence; whereas, teacher support and friend support will be the most significant predictors of individual differences in school well-being in middle adolescence; (c) self-esteem will mediate the relation between significant sources of social support and adolescents' school well-being.

This study extended beyond previous studies by testing these hypotheses with adolescent students in the Chinese cultural context. This is important because some researchers have argued that the Chinese culture represents a collectivistic culture, which emphasizes interpersonal harmony, interdependence, and concern for others more than individualistic cultures (e.g., USA; Triandis 1995). Thus, it has been suggested that the meaning and relative importance of variables such as social support, self-esteem, and emotional expression may differ across cultures. For example, the study of Kang et al. (2003) revealed stronger relations between social relationships and global self-esteem among Asian college students ($r = 0.40$) compared to American ($r = 0.21$) and Asian-American students ($r = 0.33$). The comparability across cultures of models of the determinants of school well-being should not be assumed, but rather should be tested empirically.

2 Method

2.1 Participants

A total of 250 junior high school students and 160 senior high school students were surveyed from the same school in Guangzhou, a mid-sized city located in the southern area

of China. Twenty-nine junior high school students and 20 senior high school students did not complete the survey. The resulting number of valid participants was 221 junior high school students and 140 senior high students with response rates of 88.4 % and 87.5 % respectively. Adolescents in the junior high school group ranged from 12 to 14 years old, with a mean age of 13.55 ($SD = 0.58$). Adolescents in the senior high school group ranged from 15 to 17 years old, with a mean age of 16.42 ($SD = 0.61$). Of the sample, 119 were seventh-grade students (the first year of junior high), 102 were eighth-grade students (the second year of junior high), 87 were tenth-grade students (the first year of senior high) and 53 were eleventh-grade students (the second year of senior high). A total of 46.8 % of the students were male.

The school is a public school in Guangzhou chosen because ongoing research relationships have been established between the school and the researchers' institution. The sample was a convenience sample. However, based on information provided from teachers, the authors ensured that students with varying achievement levels were included in the study. Among the sample, 74 % of the mothers and 76.7 % of the fathers had an educational level of high school or above. A total of 89.8 % of students came from a medium socio-economic level.

In China, early adolescents are mainly in junior high school and middle adolescents are in senior high school. Hence, junior high students represented early adolescents, and senior high students represented middle adolescents. In addition, Chinese students in the 9th Grade (the last grade in junior high) and 12th Grade (the last grade in senior high)—who must participate in the entrance examinations valued by Chinese parents and teachers—have unique developmental contexts. These contexts may lead them to identify a different set of support providers and to perceive their support environments somewhat differently, and, therefore, they may report distinct cognitive and emotional evaluations of their school life in comparison to the students in other grades. This study thus did not include 9th Grade and 12th Grade students.

2.2 Measures

2.2.1 Social Support Scale

This self-report scale originated from the *Network of Relationships Inventory (NRI Chinese Version*; Hou 1997), which includes 24 items that encompass five relationship dimensions (social support, companionship and intimacy, satisfaction, conflict, and punishment; Zou 1999). For this study, two dimensions of social support as well as companionship and intimacy were selected to constitute a measure of perceived social support (15 items; Li et al. 2005). Participants answered questions regarding perceived support from the following sources: (a) parents; (b) teachers; (c) friends. Ratings were done on a 5-point scale, ranging from 1 (*never*) to 5 (*always*). Responses to the 15 items assessing perceptions of each type of social support were averaged to create a score for each of the three resulting measures of social support. Previous research (Zou 1999) showed that the internal consistency coefficients of the three subscales ranged from 0.79 to 0.85. In this study, the internal consistency coefficients for the measures of parents support, teacher support, and friend support were 0.78, 0.87 and 0.88 respectively.

2.2.2 Adolescent's School Well-Being Scale (ASW-BS)

The scale assesses cognitive and affective components of Chinese adolescents' well-being in school (Tian 2008). The ASW-BS is 50-item self-report scale comprised of three

subscales: (a) school satisfaction, (b) positive affect in school, (c) negative affect in school. The School Satisfaction portion consists of 36 items (e.g., "The school has high teaching quality", "I do well in school on academic record"). Students rate each item on a 6-point Likert scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The internal consistency has been reported as 0.95 (Tian and Liu 2007). The Positive Affect portion consists of seven adjectives describing positive emotions (e.g., exciting, happy, and relaxed). The Negative Affect portion is composed of seven adjectives describing negative emotions, such as depressed, upset, and bored. Participants responded on a 6-point Likert scale, ranging from 1 (*never*) to 6 (*always*). Previous research showed that the internal consistency of the total scale was 0.94, and the one-month retest reliability was 0.72, and it has good construct validity (Tian and Liu 2007). In this study, the Cronbach's alphas were 0.92 for all three subscales: School Satisfaction, Positive Affect, and Negative Affect. The alpha for the total scale was 0.93.

2.2.3 Rosenberg's Self-Esteem Scale (Chinese Version)

The Rosenberg scale includes 10 items. Student ratings were made on a standard 4-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Studies conducted with the Chinese version of this scale have yielded internal consistency and split-half reliability coefficients above 0.70, along with significant validity coefficients (Tian 2006). In this study, the internal consistency coefficient was 0.86.

2.3 Procedure

Consistent with institutional review board procedures in China, students' and parents' informed assent was obtained before participation. All students were voluntary in this study and also had the right to drop out during the survey. A packet of self-report instruments was administered to groups of about 50 students at a time in a regular classroom environment by a trained graduate assistant. The participants all received identical verbal and written instructions from the trained assistant. The students were allowed to take as much time as needed to complete the packet of questionnaires. Generally, students took approximately 30 min to complete the study. In addition to the formal measures described below, students were asked to provide information about their age, grade, and gender.

2.4 Data Analysis

The data analysis plan followed three steps. First, descriptive analysis were conducted to address hypothesis one. 15 junior high school students and 15 senior students dropped out when the survey had just began and their questionnaire were blank. Their data were not included the final database. In addition, 14 junior high school students and 5 senior students were dropped from the initial sample due to missing data on their surveys. We obtained means and standard deviations of school well-being variables (school satisfaction, positive affect in school, negative affect in school) separately for the early adolescents and middle adolescents. We used *t*-tests for independent samples to assess the group differences. Second, to test hypothesis two, Pearson product-moment correlations were obtained separately for early adolescents and middle adolescents. The first two steps were conducted using the SPSS 15.0 statistical package (Norusis 2006). Third, using the AMOS 7.0 statistical package (Arbuckle 2006), path analysis procedures were performed to address

hypothesis three. This step was also carried out separately for the two different groups. When conducting the path analysis procedures, we first interpreted the hypothesized model (Wu 2009, p. 280). The maximum likelihood method was used to test the goodness of fit of the model. The goodness of fit index is expressed by the Chi-square value, including the ratio of Chi-square with degrees of freedom, the Normed Fit Index (NFI; Bentler and Bonnett 1980), the Comparative Fit Index (CFI; Bentler 1990), and Root-Mean-Squared Error of Approximation (RMSEA; Steiger, 1990). Based on Hou et al. (2004), the following criteria were used to determine acceptable fit of the models, with $\chi^2/df < 2$, both NFI and CFI >0.90 (approximate to 1), and RMSEA <0.08. Finally, bootstrapping, employing 1,000 samples, was used for testing significance of the mediated effects and to produce bias-corrected percentile confidence intervals (MacKinnon 2008). Finally, the size of the mediating effect was calculated.

3 Results

3.1 Descriptive Analysis

Means and standard deviations of the major school well-being variables are presented in Table 1, for early adolescents and middle adolescents respectively. We ran *t*-tests for independent samples, which revealed significant group differences on school satisfaction and negative affect for both early and middle adolescent students. As Table 1 shows, Chinese early adolescents reported significantly higher school satisfaction than middle adolescents, and Chinese early adolescents experience significantly lower frequency of negative affect than middle adolescents. No significant group differences were observed for positive affect.

3.2 Correlation and Regression Analysis

Pearson product-moment correlations among school well-being, self-esteem and social support measures are shown in Table 2. The criterion of $p < 0.05$ was used to determine statistical significance.

For Chinese early adolescents, school satisfaction and positive affect in school were significantly correlated with all social support variables. Significant correlations were also found between negative affect in school and all social support variables, with the exception of friend support. For middle adolescents, all school well-being variables were significantly

Table 1 Means and standard deviations of school well-being

Variables	Early adolescents ($n = 221$)		Middle adolescents ($n = 140$)		*t*	Cohen's *d*	Effect-size *r*
	M	*SD*	*M*	*SD*			
School satisfaction	4.43	0.77	4.28	0.56	2.25*	0.23	0.12
Positive affect in school	4.29	0.84	4.20	0.66	1.28	0.12	0.06
Negative affect in school	3.56	0.94	3.77	0.60	−2.60*	−0.27	−0.13

* $p < 0.05$

Table 2 Pearson correlation coefficients among school well-being, social support variables and self-esteem for early adolescents and middle adolescents

Variable	*M*	*SD*	1	2	3	4	5	6	7
Early adolescents ($n = 221$)									
1. School satisfaction	4.43	0.77	–						
2. Positive affect in school	4.30	0.84	0.56***	–					
3. Negative affect in school	3.56	0.94	−0.20**	−0.32***	–				
4. Parent support	3.36	0.63	0.42***	0.40***	−0.20**	–			
5. Friend support	3.66	0.66	0.18**	0.25***	0.06	0.32***	–		
6. Teacher support	2.80	0.60	0.56***	0.49***	−0.34***	0.60***	0.36***	–	
7. Self-esteem	2.82	0.49	0.43***	0.42***	−0.36***	0.40***	0.20**	0.43***	–
Middle adolescents ($n = 140$)									
1. School satisfaction	4.28	0.56	–						
2. Positive affect in school	4.20	0.66	0.45***	–					
3. Negative affect in school	3.77	0.60	−0.42***	−0.23***	–				
4. Parent support	3.46	0.58	0.37***	0.34***	−0.15	–			
5. Friend support	3.70	0.56	0.29***	0.33***	−0.03	0.41***	–		
6. Teacher support	2.60	0.51	0.48***	0.30***	−0.25**	0.45***	0.18*	–	
7. Self-esteem	3.03	0.47	0.38***	0.33***	−0.32***	0.49***	0.27**	0.27**	–

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

associated with all social support variables, with the exception of the relation between negative affect and friend support and between negative affect and parent support. For early and middle adolescents, global self-esteem correlated significantly with all school well-being and social support variables.

A hierarchical multiple regression analysis was conducted to determine the relative unique contributions of the various sources of social support in explaining individual differences in adolescents' school satisfaction. The demographic variables of gender, age, and grade were entered into the equation first to control for any confounding effects. Each form of social support (teacher, parent, and friend support) was then entered simultaneously as a predictor, with school satisfaction entered as the criterion variable. Then, the same procedures were conducted, with positive affect in school and negative affect in school entered as the criterion variables respectively. Beta weights for individual support domains were compared to determine the relative strength of the unique associations. Separate analyses were conducted for the early and middle adolescents.

The results (see Table 3) showed that, for Chinese early adolescents, social support from parents and from teachers significantly predicted school satisfaction ($\beta = 0.15$ and 0.48, respectively) and social support from teachers predicted positive affect in school ($\beta = 0.37$). However, for middle adolescents (see Table 4), social support from teachers ($\beta = 0.37$ and 0.18, respectively) contributed to school satisfaction and positive affect again and social support from friends contributed to positive affect in school ($\beta = 0.24$). Additionally, the results revealed that social support from both friends and teachers was significantly associated with negative affect for early adolescents ($\beta = 0.21$ and -0.39, respectively), whereas only support from teachers made a significant contribution to negative affect for middle adolescents ($\beta = -0.22$).

3.3 Path Analysis

According to above regression analysis results, friend support and teacher support uniquely contributed to early adolescents' school well-being whereas parent support uniquely contributed to early adolescents' school well-being, but not middle adolescents' well-being. Thus, model M1 and model M2 were proposed for early adolescents and middle adolescents separately in the present study. Model M1 and M2 were both recursive models. That is, each social support variable was hypothesized to independently predict school well-being, and each social support variable was hypothesized to indirectly predict school well-being through self-esteem. Because the multiple regression analysis yielded different associations between the various social support variables and school well-being across the two age groups, separate path models were developed for early and middle adolescents.

3.3.1 Path Analysis Model for Early Adolescents

Path analysis procedures were used to examine whether individual differences in social support from parents, friends, and teachers indirectly affected Chinese early adolescents' school well-being through the mediator of self-esteem. The model M1 was tested and yielded the following fit indices: $\chi^2 = 3.160$, $df = 3$; $\chi^2/df = 1.053$, $p > 0.05$; CFI = 0.99, NFI = 0.99, RMSEA = 0.02. This model fits the data well. To identify a more parsimonious model, we modified the model, following Bentler and Mooijaart (1989), by removing statistically non-significant paths. The more parsimonious model M3 fit the data well ($\chi^2 = 6.545$, $df = 6$; $\chi^2/df = 1.091$, $p > 0.05$; CFI = 0.99, NFI = 0.99, RMSEA = 0.02). The model M3 is a nested model relative to model M1.

Table 3 Social support predicting school well-being for early adolescents ($n = 221$)

Predictors	School satisfaction β	Positive affect in school β	Negative affect in school β
Step 1			
Gender (1 = male, 2 = female)	0.05	−0.03	0.06
Grade (1 = 7th grade, 2 = 8th grade)	−0.08	−0.14	0.17*
Age	0.12	−0.04	−0.10
	$R^2 = 0.01$	$R^2 = 0.03$	$R^2 = 0.03$
Step 2			
Parent support	0.15*	0.14	−0.03
Friend support	−0.05	0.08	0.21**
Teacher support	0.48***	0.37***	−0.39***
	$\Delta R^2 = 0.32$***	$\Delta R^2 = 0.25$***	$\Delta R^2 = 0.14$***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 Social support predicting school well-being for middle adolescents ($n = 140$)

Predictors	School satisfaction β	Positive affect in school β	Negative affect in school β
Step 1			
Gender (1 = male, 2 = female)	0.20*	0.05	−0.03
Grade (1 = 10th grade, 2 = 11th grade)	−0.12	−0.02	0.21
Age	−0.20	−0.12	−0.12
	$R^2 = 0.12^{**}$	$R^2 = 0.02$	$R^2 = 0.03$
Step 2			
Parent support	0.10	0.17	−0.10
Friend support	0.13	0.24**	0.06
Teacher support	0.37***	0.18*	−0.22*
	$\Delta R^2 = 0.20^{***}$	$\Delta R^2 = 0.17^{***}$	$\Delta R^2 = 0.07$*

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The χ^2 difference test is appropriate for determining the best-fitting model if the models are nested; that is, both models must be equivalent and possess all of the same free paths at the outset (Bentler and Bonnett 1980). The χ^2 difference test, $\Delta\chi^2$ ($\Delta df = 3$) = 3.385, $p = 0.336$, demonstrated that the additional paths did not improve model fit significantly. Thus, the more parsimonious model M3 (the one constraining non-significant paths) was selected as the final model.

3.3.2 Path Analysis Model for Middle Adolescents

Similarly, the hypothesized model M2 for the middle adolescents was examined. The model yielded the following fit indices: $\chi^2 = 1.18$, $df = 1$; $\chi^2/df = 1.182$, $p > 0.05$; CFI = 0.99, NFI = 0.99, RMSEA = 0.04, indicating a good fit and the paths among social support variables, self-esteem, and school well-being were significant.

3.3.3 Mediator Effects of Self-Esteem Between Social Support and School Well-Being

The bootstrap procedure recommended by Shrout and Bolger (2002) was used to examine the significance levels of indirect effects for the hypothesized model. If the 95 % confidence interval for the indirect effect estimate does not include zero, it can be concluded that the indirect effect is statistically significant at the 0.05 level (Shrout and Bolger 2002). An effect-size measure was applied to determine what proportion of the total effect is mediated by the intervening variable (self-Esteem,). This effect-size measure is considered adequate if all estimates are statistically significant and is used with a single mediator model (MacKinnon 2008). With respect to the model for early adolescents, the bootstrapping results indicated that mean mediation effects from teacher support through self-esteem to school satisfaction, positive affect in school and negative affect in school ($b_{school\ satisfaction} = 0.07$ [CI: 0.02, 0.14], $b_{positive\ affect} = 0.08$ [CI: 0.03, 0.15], $b_{negative\ affect} = -0.08$ [CI: −0.16, −0.03]) were significant, with magnitudes of mediator effects (the ratio of indirect effects to total effects) of 0.13, 0.17 and 0.21 respectively. Additionally, the relationship between parent support and early adolescents' school well-being was fully mediated by self-esteem. The bootstrapping results indicated that mean mediation effects from parent support through self-esteem to school satisfaction, positive affect in school and negative affect in school ($b_{school\ satisfaction} = 0.05$ [CI: 0.01, 0.11], $b_{positive\ affect} = 0.06$ [CI: 0.01, 0.12], $b_{negative\ affect} = -0.06$ [CI: −0.15, −0.01]) were significant, all with magnitudes of mediator effects (the ratio of indirect effects to total effects) of 1.00.

With regard to the model for middle adolescents, the bootstrapping results indicated that mean mediation effects from friends support through self-esteem to school satisfaction, positive affect in school ($b_{school\ satisfaction} = 0.05$ [CI: 0.01, 0.11], $b_{positive\ affect} = 0.05$ [CI: 0.01, 0.11]) were significant, with magnitudes of mediator effects (the ratio of indirect effects to total effects) of 0.22 and 0.16 respectively. Additionally, the bootstrapping results indicated that mean mediation effects from teacher support through self-esteem to school satisfaction, positive affect in school and negative affect in school ($b_{school\ satisfaction} = 0.05$ [CI: 0.02, 0.11], $b_{positive\ affect} = 0.05$ [CI: 0.01, 0.11], $b_{negative\ affect} = -0.06$ [CI: −0.14, −0.02]) were significant, with magnitudes of mediator effects (the ratio of indirect effects to total effects) of 0.12, 0.19 and 0.26 respectively.

Thus, support for a mediational role of self-esteem in the relationship between teacher support and school well-being was demonstrated across early and middle adolescents. However, support for a mediational role of self-esteem between friend support and well-being was demonstrated only for middle adolescents. Furthermore, support for self-esteem as a mediator of parent support and school well-being was obtained only for early adolescents.

4 Discussion

The major findings of this study were threefold: First, Chinese early adolescents' school satisfaction was higher than that of middle adolescents, and early adolescents' negative affect was lower than that of middle adolescents. Second, both teacher and parent support significantly related to early adolescents' school well-being whereas only teacher support, but not parent support, significantly related to middle adolescents' school well-being. Note, however, that friend support had a positive impact on the negative affect of early adolescents. Third, as expected, global self-esteem was a mediator between perceived social

support and school well-being for early and middle adolescent students. The results further support self-system processes theory and the mediation model of global self-esteem in Chinese adolescent school students.

4.1 School Well-Being of Chinese Adolescents

As hypothesized, early adolescent Chinese students reported higher school satisfaction and lower negative affect in school than middle adolescents. This finding is consistent with previous studies from several countries (Karatzias et al. 2001a, b; Konu and Lintonen 2006; Okun et al. 1990; Tian and Liu 2007). In China, early adolescents are mainly in junior high school, which is mandatory. The ultimate goal for Chinese junior high students is to gain entrance to senior high school, whereas the ultimate goal for senior high students is to be admitted into college. Thus, academic pressures (e.g., task demands, competition, and expectations) are relatively lower for the junior high students (Li et al. 2007). Given that studies suggest an inverse association between stressful life events and adolescents' levels of school satisfaction (Huebner et al. 2001; Huebner and McCullough 2000), the increased academic pressures experienced by senior high students may be one of the reasons for their lower school satisfaction and more frequent negative emotions in school. Besides the perceived pressure from the surroundings, changes in adolescents' cognitive development may also influence their school well-being. It is well known that dialectical thinking emerges during middle adolescence, resulting in increases in adolescents' critical evaluations of their environment (Epstein and McPartland 1976). Perhaps accordingly, middle adolescent Chinese students' reports of satisfaction with school revealed decreases along with increases in negative emotions relative to early adolescent Chinese students.

4.2 Different Sources of Social Support Predicting School Well-Being Between Early and Middle Adolescents

In comparison to other types of social support, support from teachers was the most significant predictor of Chinese students' school well-being across early and middle adolescence in this study. The result is consistent with a meta-analysis of studies published in the United States, on the relation between social support and well-being (Chu et al. 2010), in which the mean effect size of teacher and school personnel support ($r = 0.21$) was significantly stronger than the other effect sizes (friend, $r = 0.10$; family or relative, $r = 0.19$; other, $r = 0.10$). The result was also consistent with DeSantis-King et al.'s (2006) study of USA adolescents' school satisfaction and Danielsen et al. (2009) of Norwegian adolescents' global life satisfaction in which the results showed that teacher support was strongest source of support. Compared to teachers in more individualistic countries (e.g., USA), teachers in China are expected to play a role similar to parents, that is, guiding and caring for students (Lo 2001). Chinese tradition places great value on respect for authority. For most Chinese parents, teachers are the ultimate authority figure in their children's educational lives (Yang 2009). This function is reflected in the Chinese saying that "A teacher for a day is a father for lifetime", which is deeply inculcated in Chinese students' thinking. In other words, students must respect and love their teachers as much as their parents. Similarly, Chinese tradition requires that teachers respect and love their students as much as their own children. Therefore, the relative importance of continuing teacher support to student well-being may not be surprising for Chinese adolescents.

In contrast, the unique contributions of support from friends and parents varied across the two age groups in this study. First, friend support was unrelated to positive affect and school satisfaction and positively related to negative affect for Chinese early adolescents. For Chinese middle adolescents, friend support was significantly related to middle adolescents' positive affect, but not negative affect or school satisfaction.

The association between friend support and the experience of positive affect among these early Chinese adolescents was intriguing. Early adolescence is a stage characterized by biological, psychological, and social changes (Lord et al. 1994). During this developmental stage, adolescents typically begin to move toward greater autonomy from their parents and to develop a more extensive network of peer relationships. During later adolescence, Chinese parents foster increasing independence, and students simultaneously become more discriminating in terms of choosing their close friends. Thus, friendships among senior high school students are likely to be more stable, intimate, and emotionally supportive than friendships among junior high school students (Zou 1999). Therefore, the more selective friendships formed in senior high school may make stronger contributions to aspects of their school well-being than earlier less stable friendships.

Secondly, parent support was not uniquely associated with any of the school well-being variables across middle adolescents, with one exception. Parent support was positively related to school satisfaction for early adolescents. This result differed from that of DeSantis-King et al. (2006). In their study of USA adolescents of 11–19 years old, support from parents continued to contribute significant unique variance to US adolescents' individual differences in school satisfaction levels when students were in senior high school as well as junior high school. This difference may be related to the different role that American and Chinese parents play in students' schooling. In China, at least at present, most parents' involvement focuses on their adolescents' academic achievement; parents pay much less attention to their child's interests or social interactions. This phenomenon may be related to the deeply-rooted Chinese tradition that "School should undertake all education responsibilities" and "It is the school's business to educate the younger generation" (Zhu and Gao 2011). When their children enter senior high school, although Chinese parents care greatly about their children's academic performance, many offer little academic help due to their relatively limited knowledge. Such parents rely heavily on the school teachers' expertise to educate their children, Of course, the possible reasons for the differences in the relative importance of parent support across the studies and cultures warrant further empirical research. Furthermore, in a study of US adolescents, parent support emerged as the strongest predictor of their *global* life satisfaction (Stewart and Suldo 2011). Such findings suggest that there may be differences in the contribution of parent support to *school* well-being versus *global* well-being, which also needs further study.

To conclude, key sources of social support demonstrated varying magnitudes of relations to Chinese students' school well-being at different ages. These findings underscored the need for multidimensional conceptualizations of social support in efforts to understanding school well-being. Furthermore, the findings revealed developmental differences in the relations between social support and school well-being. Finally, the findings supported self-system processes theory in Chinese adolescent students. That is, perceived support from parents, friends, and teachers can fulfill adolescents' needs for relatedness, which, in turn, relate to school satisfaction in adolescents (Connell and Wellborn 1991).

4.3 Mediator Role of Self-Esteem

As hypothesized, adolescents' global self-esteem showed a significant mediation effect between perceived social support and adolescents' school well-being in this study of Chinese adolescents. Thus, the results support the generalizability of Harter's (1987) mediation model of global self-worth to school well-being, in that experiences of social support related to a sense of positive self-esteem, which, in turn, related to students' school well-being.

The results of this study suggest that for Chinese early adolescents, parent support indirectly affects school well-being, through their global sense of self-esteem. Studies (Ciarrochi et al. 2007; Çivitci and Çivitci 2009; Hui and Sun 2010) have suggested that self-esteem is an important element of individuals' social and cognitive development. In addition, self-esteem shows less stability in early adolescence, but gradually becomes more stable as adolescents grow older (Pulkkinen et al. 2002; Wigfield et al. 2002). Furthermore, support from parents plays a significant role in adolescents' self-esteem formation (Felson and Zielinski 1989; Whitbeck et al. 1991). Although parents, especially in China, may not be able to exert as much influence on adolescents' school life as teachers, parent support appears to indirectly influence adolescents' school well-being through their adolescents' self-esteem.

For Chinese middle adolescents, friend support appears to not only enhance school well-being directly, but also indirectly by means of improving their levels of self-esteem. This phenomenon may relate to an increasingly positive and stable self-esteem, providing the student with a stronger psychological foundation from which to choose supportive friends.

For both early and middle adolescents, teacher support appears to not only influence school well-being directly, but also indirectly by way of improving their levels of self-esteem. Again, research shows that teacher support is a crucial factor in the development of positive self-esteem among both Chinese and USA adolescents (Jia et al. 2009). According to a University of Michigan study (Juster et al. 2004) that provided a detailed snapshot of the way school-age children (6–17 years old) spend their time, American children and teens attend school for about 32.5 h a week. In contrast, Chinese students spend significantly longer periods of time with their teachers than in school and often visit their teachers at home for additional tutoring during the weekends and holidays. Thus, for Chinese adolescents it is inevitable that teachers and peers become their significant others with whom they interact frequently in school. Again, it may thus not be surprising that Chinese teachers' provision of emotional and instrumental support to students makes a relatively strong contribution to positive self-esteem and school well-being.

4.4 Study Limitations

This study has some limitations that should be noted. Most importantly, it was cross-sectional, limiting causal inferences. Longitudinal studies are needed to specify the directionality of the relationships among the variables, including the proposed mediational effect of global self-esteem. Furthermore, self-esteem was only a partial mediator of the relations between friend support and teacher support and school well-being. Thus, additional research is likely needed to identify other mediators of the relationship. Finally, all data were based on students' self-report. Although many studies have demonstrated the validity of adolescents' self-report measures (e.g., Dew and Huebner 1994; Gilligan and Huebner 2002), multiple methods of assessment would to enhance confidence in the validity of the data.

4.5 Implication

The findings of the present study offer tentative implications for educational professionals and stakeholders. One major implication involves the relative importance of students' relationships with their teachers across a variety of different cultures, including individualistic and collectivistic cultures. Although support from friends and parents is important, this study suggests that teachers may play the most influential role in determining adolescents' school-related well-being across early and middle adolescence. Student well-being has been shown to be related to a variety of important academic outcomes, such as grades, classroom behavior, and dropout (Huebner et al. 2009). Thus, teachers must likely pay equal attention to promoting student well-being and academic performance to best prepare students for success (Seligman 2009). The promotion of positive student–teacher relationships has been addressed in numerous publications (e.g., Cohen 2006; Noddings 2003). The second major implication involves the importance of considering developmental and cultural differences in the promotion of positive student well-being. Given the variations in adolescents' perceived sources of social support as well as possible variations in the roles of teachers across cultures, educational professionals and stakeholders will need to recognize that programs designed to promote student well-being must likely be tailored to specific students in specific contexts. That is, such programs must take students' developmental level and cultural background into account. Thus, it is hoped that this study stimulates greater interest in cross-cultural research on school-age students' school well-being.

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