

Mediating Effect of Academic Self-Efficacy on the Relationship between Academic Stress and Academic Burnout in Chinese Adolescents

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Abstract

The current study investigated how academic stress, academic burnout, and academic self-efficacy relate to each other; in addition, this study examined the mediating effects of academic self-efficacy on the relationship between academic stress and academic burnout of Chinese adolescents. A total of 412 students attending third-grade from two different middle schools (ninth-grade in the United States) located in Jiading District of Shanghai participated in the final analysis. By using structural equation modeling (SEM) and the maximum likelihood estimation procedures of AMOS 20.0, the latent variable measurement models were confirmed. The results and conclusions of this study are summarized as follows. A positive correlation between academic stress and academic burnout was soundly supported by this study. Meanwhile, both academic stress and academic burnout indicated negative correlations with academic self-efficacy. The modeling indicated that academic self-efficacy has a partial mediating process and a direct effect on the relationship between academic stress and academic burnout. Thus, academic stress and academic burnout were significantly weaker when academic self-efficacy was higher. In the field of education and curriculum, these results are applicable for restructuring or developing Chinese middle school curriculum utilizing useful methods for adolescents to develop their academic self-efficacy.

Keywords

academic stress, academic self-efficacy, academic burnout, Chinese adolescent students, mediating effects

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Introduction

Adolescence is generally viewed as a transitional period between childhood and adulthood. In this period, adolescents generally experience much stress or feel pressure at achieving various developmental tasks and acquiring appropriate skills and resources to become socially mature individuals (Compas *et al.*, 2001; Hicks & Heastie, 2008). Specifically, accomplishing educational requirements is one of the most significant challenges that adolescent students confront during this period and the heightened academic requirements and demands are very likely to stress adolescent students. The stresses caused by excessive academic demands may be called “academic stress,” or as learners’ mental and emotional pressure, frustration, conflicts, suppression, or anxiety that arise due

to school performance, inappropriate workloads, examinations, and academic grades within household, school, and social environments (Kim & Kim, 2004; Lin & Huang, 2014; Yusoff, 2010). In addition, academic stress can be defined in relation to high academic self-expectations or high academic expectations from parents and teachers (Ang & Huan, 2006).

Academic or school-related stresses are a common concern of adolescents in societies globally because adolescents spend most of their time in school environments (Byrne *et al.*, 2007; Kaplan *et al.*, 2005; Lee *et al.*, 2010; Lee *et al.*, 2013; Schrami *et al.*, 2011). Academic stress, however, is the most significant source of adolescents' stress in Asian countries such as China, Hong Kong, Japan, Korea, Singapore, and Taiwan that traditionally assign a high value to education; parents' excessive education fever and high expectations about children's academic achievement exist due to the educational system focusing only on college entrance examinations (Ang *et al.*, 2007; Huan *et al.*, 2008; Lee *et al.*, 2010; Liu & Lu, 2011; Tan & Yates, 2011). In particular, academic stress and pressure that Chinese adolescents experience may be even more intense than their counterparts in Western and other Asian countries (Liu & Lu, 2011; Wu & Sun, 2008). According to research investigating the level of academic stress among adolescents in China, Japan, Korea, and the United States, China had the highest level of academic stress of adolescent students among four countries. Moreover, it was reported that Chinese adolescents under academic stress had more emotional problems than their counterparts in three other countries (China Youth & Children Research Center, 2010).

When adolescents perceive excessive academic stresses, they may react to the stresses physically and psychologically (Yoo *et al.*, 2014). It has been well documented that academic stress adversely affects adolescents' well-being and leads to a variety of negative manifestations of academic stress including problematic behaviors (Lee & Larson, 2000; Shek, 1995), and mental distress (Lee *et al.*, 2009; Liao & Wei, 2014; Liu & Lu, 2012; MacGeorge *et al.*, 2005; Ying & Liese, 1991). Moreover, some studies support that excessive academic stress is a main factor predicting adolescent students' psychological distress about academic performance such as academic burnout symptoms (Jo *et al.*, 2013; Shin & Yu, 2014) and intrinsic motivation (Liu, 2015).

As an interesting outcome variable of this study, academic burnout originated from the concept of "burnout" which was first used by Freudenberg (1974), explaining a phenomenon in individuals who repeatedly experienced frustration, skepticism, and fatigue think less of themselves and lose their motivation. The concept of burnout is generally defined as "a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who do 'people work' of some kind" (Maslach & Jackson, 1986, p. 1). Initially, studies of the burnout concept were restricted to groups of human service professionals such as teachers and nurses (Cedoline, 1982; Friedman, 2003; Skovholt, 2001). Later, this concept has been expansively adopted in other occupational fields outside human service (e.g., businesspersons; Gyskiewicz & Buttner, 1992; Jang, 2007; Lee, 2008).

More recently, a growing body of research has investigated burnout among students because academic activities and demands such as attending class, completing school assignments, and passing examinations can be regarded as students' work (Balogun *et al.*, 1996; Jo *et al.*, 2013; Lee *et al.*, 2009; Lee *et al.*, 2013; Lin & Huang, 2014; Salmela-Aro & Tynkynen, 2012; Schaufeli *et al.*, 2002; Shin, 2015; Yang, 2004; Walburg, 2014; Zhang *et al.*, 2007). That is, students can experience burnout when they are overwhelmed by their excessive academic workload and may lose interest in study due to their sense of inadequacy or incompetence (Kim *et al.*, 2010; Shin & Yu, 2014). Malakh-Pines, Aronson, and Kafry (1981) examined college students' burnout and found that they had middle to upper levels of burnout. Researchers regard this kind of burnout as "academic burnout." Academic burnout is defined by three components: feeling exhausted because of academic demands (exhaustion), having a cynical and detached attitude toward school tasks (cynicism), and feeling incompetent or inadequate as a student (inefficacy; Salmela-Aro *et al.*, 2009; Schaufeli *et al.*, 2002). Given that students are very likely to be vulnerable to academic burnout, it is important to examine the academic burnout syndrome predicted by the impact of excessive academic stress in a group of students.

Plenty of studies have described that academic burnout of students is caused by academic stress (Walburg, 2014). At a college level, the findings of previous studies suggested that academic

stress including course loads and maladaptive perfectionism has a positive direct effect on students' burnout (Lin & Huang, 2014; Yang, 2004; Zhang *et al.*, 2007). Huang and Lin (2010) found that college students with higher scores related to life stress including academic stress tended to show higher degrees of learning burnout in Taiwan. On the contrary, Jacobs and Dodd (2003) investigated 149 undergraduate participants in the U.S. and found that actual academic workloads had little effect on students' burnout, but their grade point average (GPA) was significantly correlated with the emotional exhaustion of burnout syndrome. Two studies investigated Korean adolescent students in the metropolitan area and found that academic burnout was significantly influenced by excessive academic demands and stresses regarding GPA, examinations, and school classes (Jo *et al.*, 2013; Shin & Yu, 2014). In addition, Kiuru and colleagues (2008) investigated 773 ninth grade students in Finland and found that the lower the adolescents' academic achievement, the greater the adolescents' school burnout. As such, this ensures that adolescents experience academic burnout during their school learning period and excessive academic stress is a main predictor of their burnout such as emotional exhaustion, cynicism, and lack of academic efficacy.

Although these results in adolescent' academic burnout may be entirely conclusive, further research is still needed. Most extant studies on academic burnout have been conducted in college level students. Despite the findings about adolescents' burnout from some studies, little is still known about adolescents' burnout and the relationship between their academic stress and academic burnout. Moreover, as of today, there is very little research available as to whether academic stress affects burnout syndrome in Chinese adolescent students. The reviewed studies were predominantly completed in Western societies and other Asian countries, although academic burnout has been a popular research issue in educational and psychological areas and academic learning is currently one of the most noteworthy issues in Chinese society (Yang, 2004). Therefore, the current study examined the relationship between adolescents' academic stress and their academic burnout syndrome in a Chinese high school sample.

Mediating Effect of Academic Self-Efficacy

As to the relationship between academic stress and academic

burnout, students may differ considerably in the ways and extent to which their academic burnout is affected by exposure to their academic stressors. Researchers have proposed that the degree and status of academic stress is not shown uniformly across all the students but likely to be determined according to individual differences that can be referred to as personal resources (Oh & Seon, 2013; Yoo *et al.*, 2014). Personal resources are "the qualities that are capable of influencing the effects of stressors on people's mental health" (Pearlin & Bierman, 2013, p. 330). Among personal resources, students' self-efficacy has received increasing attention from researchers as one of the effective individual factors to govern the effects of academic stress on stress outcomes (Chiu, 2014; Hen & Goroshit, 2014; Jo *et al.*, 2013; Lee & Jeon, 2015; Oh & Seon, 2013; Yoo *et al.*, 2014; Zajacova *et al.*, 2005). Self-efficacy was first presented in Bandura's (1977) social cognitive theory and defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). As a multidimensional construct, self-efficacy consists of three components: self-confidence, self-regulatory efficacy, and task difficulty preference (Jo *et al.*, 2013; Lee & Jeon, 2015).

While examining the mediating effect of self-efficacy on the relationship between academic stress and burnout, some studies used the measure of generalized self-efficacy rather than academic self-efficacy (Charkhabi *et al.*, 2013; Evers *et al.*, 2002; Yang, 2004; Yoo *et al.*, 2014). Because the purpose of this study is focused on academic environments, and there is evidence to show that academic self-efficacy indices may be more appropriate in research on academic outcomes than generalized measures (Ferrari & Parker, 1992; Lindley & Borgen, 2002; Multon *et al.*, 1991), this study used a measure of academic self-efficacy. It measures "students' confidence in their ability to carry out such academic tasks as preparing for exams and writing term papers" (Zajacova *et al.*, 2005, p. 679).

Theoretically, the stress process model (Pearlin, 1989) proposes a pathway that life stressors elevate or diminish the effects of personal resources; in turn, personal resources influence the psychological outcomes of stressors. In this model, mediating personal resources comprise multiple indicators such as coping, social support, mastery, and belief systems (Pearlin, 1989; Pearlin

& Bierman, 2013). Among these personal resources, self-efficacy coincides with the concept of personal mastery that is conceptualized as individuals' self-perception of their ability to control life circumstances. The stress process model can be employed to examine the mediating effect of academic self-efficacy as a path that students' academic stress reduces a sense of their academic self-efficacy or belief in their abilities to complete academic tasks and in turn their low self-efficacy produces the negative outcome of academic burnout syndrome.

Empirical examinations have consistently validated the role of academic self-efficacy in the relationship between academic stress and academic burnout. In terms of the relationship between academic stress and academic self-efficacy, researchers found that academic stress has a direct negative effect on academic self-efficacy among students (Chiu, 2014; Oh & Seon, 2013; Min, 2011). Park (2011) investigated 191 fourth-grade and 250 sixth-grade elementary school students in Korea and found that children's life stress including academic stress was negatively correlated with academic self-efficacy and subjective well-being. As for the direct impact of academic self-efficacy on academic burnout, researchers have described that academic self-efficacy was negatively related to academic burnout among students (Charkhabi *et al.*, 2013; Lee & Jeon, 2015; Yang, 2004). Regarding the mediating effect of academic self-efficacy, the findings of Jo and colleagues (2013) showed that academic self-efficacy and failure tolerance partially mediated the effect of excessive academic demands on academic burnout among Korean high school students. Additionally, Yoo and colleagues (2014) investigated 2,448 eighth-grade students in Korea and reported that adolescents' academic stress had a positive effect on internalization and externalization, and self-efficacy had a mediating effect on the relationship between academic stress and outcomes.

These studies have reliably demonstrated the associations among students' academic stress, academic self-efficacy, and academic burnout. However, research regarding the mediating effects of academic self-efficacy in the relationship between academic stress and academic burnout remains insufficient. In addition, to date, there is no access to any published studies exploring a direct effect of academic self-efficacy or mediating effects on the relationship between academic stress and academic

burnout among Chinese adolescent students. Thus, more research is clearly needed to fully understand the relationships among academic stress, academic self-efficacy, and academic burnout among Chinese adolescent students in particular.

Current Study

The current study investigated how academic stress, academic burnout, and academic self-efficacy relate to each other; in addition, this study examined whether academic self-efficacy can mediate the relationship between academic stress and academic burnout of Chinese adolescent students. Based on the purpose of this study, two research questions were addressed: (1) what is the relationship between academic stress, academic self-efficacy, and academic burnout? and (2) does academic self-efficacy mediate the impact of academic stress on academic burnout? Based on the literature discussed previously, the research framework was established and is presented in Figure 1. The results of this study will not only provide information to more fully understand the relationships among academic stress, academic self-efficacy, and academic burnout of Chinese adolescents, but also help to develop stress-prevention or reduction strategies and intervention programs for academic stress and self-efficacy of Chinese adolescents.

Method

Participants and Procedure

Participants of this study were Chinese students in middle school. Before collecting data in China, the Korean language questionnaire was first prepared based on previous studies (Kim, 2001; Lee, 2009; Min, 2011; Nam, 2001; Park, 1998). Then, a preliminary test was completed on 34 third-grade students at a middle school (ninth-grade in the United States) in

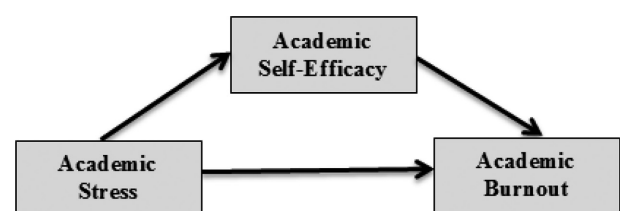


Figure 1. Conceptual Framework

Bucheon, Korea. Based on the results of the pretest in Korea, the questionnaire was translated into the Chinese language. The second pretest was conducted on 21 third-grade students at a middle school in Jiangsu province, China. Based on the second pretest in China, the reliability and validity of the Chinese questionnaire version were evaluated and revised with the careful consideration of culturally appropriate meaning on each item. Finally, data were collected between October 8 and 12, 2012. Two different middle schools were randomly selected in Jiading District, a suburban district of Shanghai, China. It is one of the fastest developing, industrial areas in Shanghai. The permission for conducting the survey and using data from those two middle schools was granted before the survey. After explaining the research purpose and investigation contents, teachers were trained to implement the survey during classroom time. Under their supervision, 450 third-grade students who were about to take the high school entrance examination were asked to complete a survey; 412 responses (less 38 incomplete responses) were used as data for the final analysis of this study.

In this sample, 198 (48.1%) students were male and 214 (51.9%) students were female. In age, although participants ranged in age from 13-17 years, fourteen-year-old and fifteen-year-old students accounted for 61.7% and 26% of all participants respectively. Regarding their academic achievement level, the rates of the upper, middle-upper, middle, middle-low, and low ranks were 9.2%, 30.6%, 29.6%, 20.9%, and 9.7% respectively. The majority of participants were in middle-upper and middle ranks. In terms of socioeconomic status, the majority of participants were in the middle class (66.5%) and the middle-upper class (27.4%). In fathers' education, 34.7% of participants' fathers had college or bachelor's degrees; 33.3% had high school diplomas; and 27.7% had not completed high school. In mothers' education, 37.1% of participants' mothers had not completed high school; 31.8% had high school diplomas; and 29.4% had college or bachelor's degrees. In fathers' occupation, more than half of participants (52.9%) reported that their father was a manufacturing or technical worker engaged in manufacturing. In mothers' occupation, 33.5% reported that their mother was a manufacturing or technical worker and 21.4% reported that their mother was engaged in an office job.

Measures

Academic stress. Academic stress was assessed with a 38-item scale used in the study of Oh and Chan (1994). Each item has a five-point Likert scale and higher scores reflect more academic stress. Cronbach's alpha coefficients for academic stress were .917. In addition, the 38-item scale consists of five subscales: (1) academic achievement, (2) stress related to test, (3) attending the class, (4) stress related to study, and (5) concerns over future career. The reliability of each subscale was .624 (academic achievement), .807 for stress related to test, .775 for attending the class, .805 for stress related to study, and .796 for concerns over future career. Thus, academic stress was treated as a latent variable that was not directly observable but measured by using the scores of five subscales.

Academic self-efficacy. Academic self-efficacy was measured by a 28-item scale that Kim and Park (2001) developed and verified. Each item has a five-point Likert scale and the reliability of the 28-item scale for academic self-efficacy was .884. Three subscales were identified using the 28-item scale: (1) preference of task difficulty, (2) self-regulated efficacy, and (3) self-confidence on individual ability. The first subscale of preference of task difficulty indicates to what extent students would accept the difficulty level of challenging academic work in the process of selecting the work that they can control or handle. The second subscale of self-regulatory efficacy is regarded as expected efficacy with concentration on their academic works and performance of self-control capability when setting up their academic goals. The third subscale of self-confidence on individual ability is about confidence in their ability or the degree of belief. Three subscales' scores yielded Cronbach's alpha coefficients of .824 for task difficulty preference, .830 for self-regulatory efficacy, and .848 for self-confidence. In this study, academic self-efficacy was treated as a latent variable measured by three subscales considered as observed variables.

Academic burnout. To measure academic burnout, this study used the Korean Academic Burnout Inventory (KABI) modified by Lee and colleagues (2009) for Korean adolescent students. The Korean Academic Burnout Inventory originated from Maslach Burnout Scale-Student Survey which is a modified version of Maslach Burnout Inventory-General Survey for university student

samples (Schaufeli *et al.*, 2002). The KABI consists of 25 items that constitute five subscales: (1) emotional exhaustion (e.g., I feel exhausted by my studies), (2) incompetence (e.g., I seem to have no competence in my studies), (3) antipathy to study (I would like to live in a world without studying), (4) cynicism (e.g., I doubt the significance of my studies), and (5) anxiety (e.g., I have so many worries because of my studies). Each subscale has five items. All items were scored on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha value of the overall scale of KABI for academic burnout was .939. Reliability coefficients for each subscale were .902 for emotional exhaustion, .886 for incompetence, .878 for antipathy to study, .595 for cynicism, and .774 for anxiety. In the conceptual model of this study, exhaustion, inefficacy, antipathy, cynicism, and anxiety loaded on a latent variable of academic burnout.

Statistical Analyses

To examine the relationship among levels of academic stress, academic self-efficacy, and academic burnout, the current study used SPSS Statistics version 20.0 and AMOS 20.0 programs. First, Cronbach's alpha coefficients were assessed to test the internal reliability of scales and Pearson's correlation coefficient analysis was conducted to examine the inter-correlations between all variables. Second, confirmatory factor analyses (CFA) were performed to assess the discriminant validity between latent variables and select the measurement model best fit to data. Third, the hypothetical structure equation model (SEM) was used to estimate the relationship between latent variables and verify the statistical significances of estimated values.

The measurement models' goodness-of-fit was evaluated by the indices of the χ^2 goodness-of-fit statistic and root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), Tucker-Lewis index (TLI), and comparative fit index (CFI). RMSEA is calculated with chi-square value assessing the model fit, the degree of freedom, and sample size. RMSEA ranges from 0 to 1 with 0 indicating exact model fit and 1 indicating bad model fit. In social science, values of RMSEA less than .05 are considered as indicators of good model fit and those between .05 and .08 are indicative of acceptable model fit. If

RMSEA values are greater than .10, the models should be rejected (Browne & Cudeck, 1993). Values of GFI, AGFI, TLI, and CFI are less than 0 or greater than 1. The cutoff values of GFI, AGFI, TLI, and CFI should be higher than .90 to be considered good model fit (Bentler, 1990; Hu & Bentler, 1999; Tucker & Lewis, 1973). To compare different model fits, a chi-square different test was computed to determine whether a given model fits significantly better than a competing model. Through a chi-square difference test, the final model was selected and bootstrapping was conducted to test the indirect effects of independent variables through mediators. In addition, the squared multiple correlations (SMC or R^2) of dependent variables were examined to represent the proportion of their variance explained by their predictors.

Results

Prior to performing structural equation modeling, the univariate distributions and descriptive statistics of variables were examined. Normality is one of the basic assumptions in conducting structural equation modeling analysis. To meet the assumption that each variable should be normally distributed, the values of skewness and kurtosis of each variable should be within the acceptable range ± 2 and ± 7 respectively (West *et al.*, 1995). It is evident that a non-normal distribution of each variable may draw the skewed results in SEM analysis. Table 1 presents the means, standard deviations, and indices of skewness and kurtosis for key variables in this study. All observed variables were normally distributed based on acceptable ranges of the skewness and kurtosis values.

Correlational Analyses

To examine correlations among key variables, bivariate analyses were conducted. Table 2 displays Pearson correlation coefficients among study constructs. All sub-indicators of academic stress were positively correlated with all sub-indicators of academic burnout. On the other hand, all sub-indicators of academic self-efficacy were negatively correlated with all sub-indicators of academic stress and academic burnout. This indicates that when students felt more academic stress, their levels of academic burnout increased whereas the levels of academic self-efficacy decreased.

Table 1. Descriptive Statistics of Measured Variables (N=412)

Latent variables	Observed variables	Mean	Standard Deviation	Skewness	Kurtosis
Academic stress	Academic achievement	3.3204	.62734	-.319	.596
	Stress related to test	3.2206	.69370	.096	.344
	Attending the class	2.4945	.68473	.437	.747
	Stress related to study	3.0518	.71599	-.030	.230
	Concerns over future career	2.6488	.79375	.099	-.046
Academic self-efficacy	Preference of task difficulty	2.9922	.64829	-.067	.783
	Self-regulated efficacy	3.2413	.58046	-.132	.705
	Confidence on individual ability	3.0570	.78899	-.056	.040
Academic burnout	Emotional exhaustion	3.1160	.92893	.028	-.230
	Incompetence	2.6238	.94867	.369	-.154
	Antipathy to study	2.9733	.99740	.117	-.523
	Cynicism	2.7631	.67647	.266	.459
	Anxiety	3.0660	.83960	.159	.092

Note. Academic stress (1-5), Academic self-efficacy (1-3), Academic burnout (1-5).

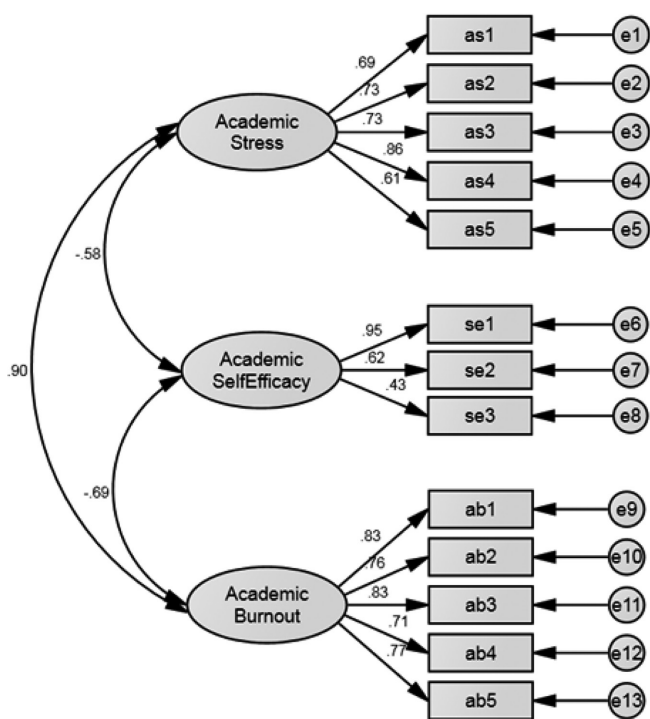


Figure 2. Factor Loading of Measurement Model

Note. N=412; All parameters are standardized. as1=academic achievement; as2=stress related to test; as3=attending the class; as4=stress related to study; as5=future career; se1=preference of task difficulty; se2=self-regulated efficacy; se3=confidence on individual ability; ab1=emotional exhaustion; ab2=incompetence; ab3=antipathy to study; ab4=cynicism; ab5=anxiety.

Test of the Overall Model

To test whether observed study variables appropriately explain a set of latent variables and the measurement model fits data, confirmatory factor analysis (CFA) was conducted. As shown in Figure 2, the goodness-of-fit of a measurement model of three latent variables (academic stress, academic self-efficacy, and academic burnout) and observed variables of each latent variable was evaluated. The results from multiple indices to test the goodness-of-fit of the measurement model are as follows. AGFI (= .857) fell short of .90, but GFI (= .903) and the incremental fit indices TLI (= .906) and CFI (= .926) were over .90. χ^2 (62) was 277.265, $p < .001$. Given RMSEA = .092, RMSEA and GFI satisfied the evaluation criterion (< .10). Generally, standardized factor loadings (β) are statistically significant and should be over .50; the desirable figure is over .70 (Lee & Lim, 2011). However, according to Kim (2007), when the absolute value of factor loadings (β) is more than .40, the variable is generally considered significant. The factor loading of each measurement variable used in this study was more than .40, which was statistically significant and met the evaluation criterion. Therefore, the measurement model set in this study was acceptable.

Test of the Mediation Model

Based on previous studies according to which there were

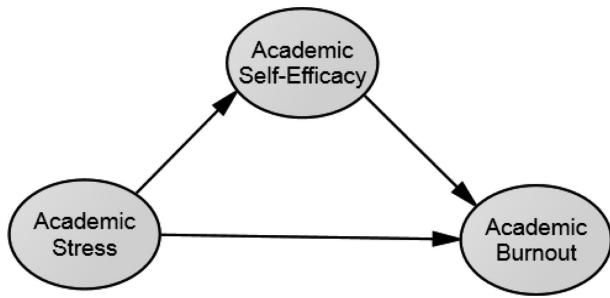


Figure 3. Research Model (Partial Mediation Model)

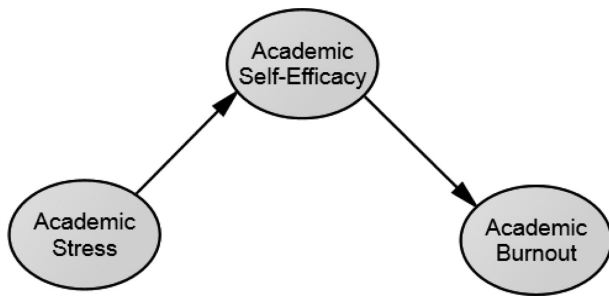


Figure 4. Competing Model (Full Mediation Model)

significant relationships between academic stress and academic self-efficacy, between academic self-efficacy and academic burnout, and between academic stress and academic burnout, this study proposed a partially mediated model (see Figure 3) and a fully mediated model (see Figure 4) of academic stress, academic self-efficacy, and academic burnout, and examined the mediating effects of academic self-efficacy. By comparing the goodness-of-fit indexes between the two models, the final model suitable to the data structure was chosen.

As shown in Table 3, on the assumption that academic self-efficacy has a mediation effect on the relationship between academic stress and academic burnout, the goodness-of-fit indexes of the partially mediated and the fully mediated models were applied for analysis. GFI, AGFI, TLI, and CFI of the partially mediated model were .903, .857, .906, and .926 respectively. GFI, AGFI, TLI, and CFI of the fully mediated model were .887, .836, .877, and .900 respectively. GFI, AGFI, TLI, and CFI are relative

Table 2. Correlations Coefficients between Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Academic stress													
① academic achievement	1												
② stress related to test	.632**	1											
③ attending the class	.458**	.503**	1										
④ stress related to study	.588**	.611**	.637**	1									
⑤ concerns over future career	.368**	.374**	.472**	.539**	1								
Academic burnout													
⑥ emotional exhaustion	.507**	.588**	.556**	.676**	.473**	1							
⑦ incompetence	.516**	.506**	.522**	.574**	.473**	.563**	1						
⑧ antipathy to study	.458**	.467**	.572**	.630**	.445**	.708**	.619**	1					
⑨ cynicism	.453**	.451**	.509**	.518**	.476**	.533**	.597**	.612**	1				
⑩ anxiety	.479**	.525**	.472**	.591**	.399**	.678**	.580**	.623**	.550**	1			
Academic self-efficacy													
⑪ preference of task difficulty	-.327**	-.345**	-.443**	-.479**	-.308**	-.525**	-.542**	-.557**	-.420**	-.465**	1		
⑫ self-regulated efficacy	-.190**	-.186**	-.316**	-.313**	-.318**	-.280**	-.402**	-.325**	-.332**	-.223**	.596**	1	
⑬ self-confidence on individual ability	-.317**	-.366**	-.344**	-.367**	-.342**	-.425**	-.421**	-.345**	-.317**	-.420**	.400**	.110*	1

* $p < .05$. ** $p < .01$.

Table 3. Fit Index of Partial Mediation and Full Mediation Models

	χ^2	df	p	GFI	AGFI	TLI	CFI	RMSEA (90% CI)
Research Model (partial mediation model)	277.265	62	.000	.903	.857	.906	.926	.092 (.081-.103)
Competing Model (full mediation model)	351.265	63	.000	.887	.836	.877	.900	.106 (.095-.116)
$\Delta\chi^2$	74.000	1						

goodness-of-fit indexes to see how research models improve in comparison with baseline model. When the indexes are greater than .90, the model has a good fit. According to the analysis criterion, the goodness-of-fit indexes of the fully mediated model had high errors while the indexes of the partially mediated model had better goodness-of-fit indices. In addition, according to the RMSEA values reflecting model explanatory power and parsimony, the partially mediated model was .092 (an ordinary goodness-of-fit index) while the fully mediated model was .106. This indicates that the error of the model was increased.

The research model (partially mediated model) and the competing model (fully mediated model) have a nested relationship. Therefore, this study conducted chi-square test to choose the model that explains data better. According to the chi-square test of the two models, $\chi^2(62)$ of the partially mediated model was 277.265, $p < .001$ and $\chi^2(63)$ of the fully mediated model was 351.265, $p < .001$. The chi-square values of the two models were rejected. That is interpreted as because chi-square value is sensitive to big samples. The chi-square value of the research model was 74.000 smaller than that of the competing model and its degree of freedom was one less. When the degree of freedom is one, chi-square value is 3.84. Therefore, the research model can explain data better than the competing model. In this case, the null hypothesis (H_0) that the research model is fit at the level of $\alpha = .05$ is rejected ($\Delta\chi^2 = 74.000 > \chi^2_{.05}(1) = 3.84$, $\Delta df = 1$). In other words, although the degree of

freedom of the partially mediated model was one lower than that of the completely mediated model, the reduction width of the chi-square value fell enough to set off the decrease in the degree of the freedom. Therefore, the research model was better than the competing model.

The parameter estimates obtained from the partially mediated model are presented in Table 4. The path from academic stress to academic self-efficacy was analyzed. As a result, academic stress negatively influenced academic self-efficacy ($\beta = -.578$, $p < .001$). In the path from academic self-efficacy to academic burnout, academic self-efficacy negatively influenced academic burnout ($\beta = -.252$, $p < .001$). In the path from academic stress to academic burnout, academic stress positively influenced academic burnout ($\beta = .758$, $p < .001$). In addition, each path coefficient was statistically significant.

Meanwhile, the bootstrapping method was applied to conduct SMC. The results are presented in Table 5. In the case of academic self-efficacy, 33.4% of its variance was explained by academic stress. In the case of academic burnout, 85.9% of its variance was explained by academic stress and academic self-efficacy. In addition, the direct effect, the indirect effect, and total effects were analyzed in terms of figures; in the partially mediated model, academic stress had a statistically and significantly direct and indirect effect on academic burnout. However, the indirect effect ($= .146$, $p < .001$) was less influential than the direct effect ($= .758$,

Table 4. Estimates of Latent Variables

Path of Latent Variables	B	β	S.E.	C.R.	<i>p</i>
Academic stress → Academic self-efficacy	-.737	-.578	.078	-9.427	***
Academic self-efficacy → Academic burnout	-.316	-.252	.058	-5.442	***
Academic stress → Academic burnout	1.211	.758	.111	10.865	***

*** $p < .001$

Table 5. Direct, Indirect, and Total Effects of Model

Path of Latent Variables	Bootstrapping			R^2
	Direct effect	Indirect effect	Total effect	
Academic stress → Academic self-efficacy	-.578***	.000	-.578***	.334
Academic self-efficacy → Academic burnout	-.252***	.000	-.252***	.859
Academic stress → Academic burnout	.758***	.146***	.904***	

** $p < .001$

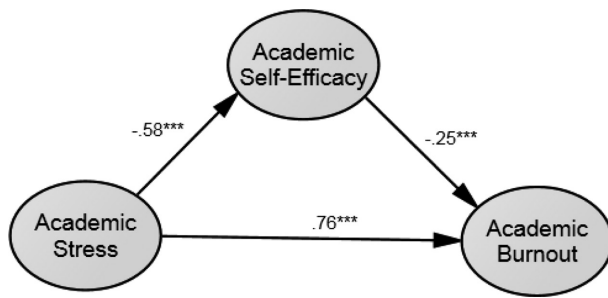


Figure 5. Result of Mediating Effect Analysis
 Note. N=412; All parameters are standardized. *** $p < .001$

$p < .001$). This means that the indirect influence of the academic stress on academic burnout via academic self-efficacy was smaller than its direct influence.

In conclusion, this study chose the partially mediated model as the final model, as shown in Figure 5. Therefore, academic stress influenced academic burnout with the mediation of academic self-efficacy. In other words, academic stress influenced academic burnout through its direct and indirect paths and academic self-efficacy partially mediated the influence of academic stress on academic burnout.

Discussion and Application

The subjects of the current study were 198 male and 214 female third-grade students in two middle schools in Shanghai, China. This study attempted to investigate the mediation effects of Chinese students' academic self-efficacy in the relationship between academic stress and academic burnout, given that academic burdens on Chinese middle school students have increased in an education system based on high school or college entrance examinations. The study provides fundamental material to identify solutions to deal with academic stress efficiently, improve academic self-efficacy, and lower the risk of academic burnout. The results of this study are summarized and discussed below.

First, academic stress was found to have a high positive correlation with academic burnout, and its positive influence was statistically significant in the path model. In other words, the more the students felt academic stress, the higher their level of academic burnout was. This result corresponds to previous empirical findings in adolescents (Jo *et al.*, 2013; Kiuru *et al.*, 2008; Shin, 2011; Shin

& Yu, 2014). This result indicates that excessive academic stress in Chinese adolescent students accompanies academic burnout, and it is important to make active efforts to prevent or alleviate their academic stress.

The study identifies several implications from this result. In terms of education settings and school practices, it may be necessary to develop diverse teaching and learning methods for students with different levels of learning competence. In addition, it may be valuable to develop intervention programs in order to deal with academic stress effectively. As found in Kim *et al.* (2013), Chinese adolescents mostly spent their after-school hours playing computer games or watching TV, rather than engaging in physical activities that are likely to be effective in managing life and academic stress. Furthermore, given that Chinese students are under too much pressure to study, parents and teachers should not demand excessive academic achievement from adolescent students but try to motivate them academically, because well-motivated students perform well academically (Moon, 2012). Above all, it is necessary for the government to take steps to change the competitive educational atmosphere in such a way as to reduce the academic burdens on adolescent students to reduce their stress levels and improve the quality of school life.

Second, the process model of this study in relation to academic self-efficacy as a mediator was examined. It was found that academic stress influenced academic burnout both directly and indirectly. The students' academic stress had a relatively high inverse correlation with academic self-efficacy; the higher the students' academic stress was, the lower their academic self-efficacy was. This result was similar to results of previous research exploring the relationship between academic stress and academic self-efficacy among students of all age groups (Chiu, 2014; Min, 2011; Oh & Seon, 2013; Park, 2011). The students' academic self-efficacy also correlated with their academic burnout; this was a statistically and significantly negative influence. In other words, as their academic self-efficacy increased, it was possible to lower their academic burnout.

The students' academic self-efficacy partially mediated the impact of academic stress on academic burnout. That is, their academic stress affected their academic burnout directly and indirectly through the mediating effect of academic self-efficacy.

This suggests that when experiencing academic stress, Chinese students with higher academic self-efficacy are less vulnerable to academic burnout. This finding provides support for the stress-process model that personal resources—specifically academic self-efficacy—play a mediating role in the relationship between life stressors (academic stress) and the psychological outcome of stressors (academic burnout). This finding also corresponds with the findings of Jo and colleagues (2013) and is similar to the results of Yoo and colleagues (2014). Thus, it is important to make every endeavor to boost the academic self-efficacy of Chinese adolescent students as a personal and psychological resource.

To seek effective strategies or programs to increase academic self-efficacy levels among Chinese adolescent students, it is necessary to discuss this issue in relation to the field of education and the curriculum. Bandura (1993) argued that, “the major goal of formal education should be to equip students with the intellectual tools, efficacy beliefs, and intrinsic interests needed to educate themselves in a variety of pursuits throughout their lifetime” (p. 136). The curriculum for Chinese middle schools consists of a basic-type curriculum, an expanded-type curriculum, and an exploration-type curriculum (based on Shanghai). These curricula include multiple subjects: thinking and virtue, national language, mathematics, English, science (or physics, chemical science, and biology), history and society (or history, geography), physical education and health, and the arts (or music, fine art) (Ministry of Education of People’s Republic of China, 2001). Among these subjects, the subject “thinking and virtue” covers some content relating to youth stress management. However, in the Chinese curricula for middle schools, there is no specific subject, such as home economics, or unit, such as youth self-management, that is sufficiently likely to play a useful role in dealing with the academic stress and self-efficacy of adolescents.

In Korea, a neighboring country of China with the same cultural values, the national curriculum for middle schools involves the subject “Technology·Home Economics” for first- to third-grade students in middle school, in accordance with the 2009 national revised curriculum. In practical terms, this subject intends to enable learners to have knowledge, ability, and value judgments about “household life” and “the technical world,” to learn basic

techniques to solve life problems and to enjoy personal and domestic life in a healthy way through practical experiences, thereby improving their competence and attitude in their current and future lives. Specifically, in the unit of “youth self-management,” educational goals include teaching the students to understand adolescence and their stresses, to evaluate and solve their own circumstantial and life problems, and thereby to improve their living conditions (Korea Ministry of Education, Science and Technology, 2011). Yu and Lee (2013) developed practical problem-based teaching and learning plans focusing on the unit of youth self-management in the subject of Technology·Home Economics and verified that there are the effects of the lessons on the self-efficacy of Korean adolescent students in middle schools. Chinese educators may want to consider developing relevant educational plans and practical subjects that help adolescents deal effectively with their stress and enhance their self-efficacy. In future studies, it may be necessary to verify the validity and reliability of the contents dealt with in the Korean middle school curriculum or of educational resources from other countries to adopt them in Chinese sociocultural environments. In addition, it may be necessary for households and schools to support various activities or programs that encourage a high sense of self-worth among students while encouraging academic achievement alongside healthy emotions and minds.

There are some limitations that need to be discussed with respect to generalizing from this study’s results. The study was conducted with students who were in a particular year of particular middle schools in a particular region. As a result, it is difficult to apply the results to the general Chinese middle school student population. Therefore, to obtain deeper and more substantial information, it will be necessary to recruit adolescents from other years and other regions, to apply quantitative research methods or conduct a follow-up study based on a qualitative approach. Despite the above limitations, this study is meaningful in the respect that it provides fundamental information to understand Chinese adolescent students’ academic stress, academic burnout, academic self-efficacy, ways of dealing with stress, adaptation to school life, and other principal factors, as well as the characteristics of control variables, including gender and academic record.

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