

Stress from Academics, Stress from Interpersonal Relationships and Academic
Burnout Among Chinese Adolescents

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Abstract

The current study examined relations between stress and academic burnout, and the moderating role of adaptive academic coping between stress from academics and academic burnout among adolescents. Potential stress leading to academic burnout included stress from academics and stress from interpersonal relationships (stress from teacher, parental, peer relationships). Five-hundred and eighteen students (48.26% male, 14 to 15 years old) from one middle school in China participated in this study. Structural equation modeling indicated that (1) academic burnout was significantly predicted by stress from academics and stress from parental relationships, but was not significantly predicted by stress from teacher and peer relationships, and (2) adaptive academic coping significantly moderated the association between stress from academics and academic burnout, after controlling for the effects of sex, age, socioeconomic status, and grade ranking. This study provided insight into which types of stress perceived by Chinese adolescents (e.g., stress from academics and interpersonal relationships) predicted academic burnout, and how adaptive academic coping might mitigate links between academic stress and academic burnout. Recommendations of the current study are discussed in terms of government, school and teacher, and parental aspects.

Keywords

Stress, Academic burnout, Adaptive academic coping, Chinese adolescents

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Introduction

Stress is inevitable in an individual's life. Studies indicate that frequent and prolonged arousal through stress or pressure leads to mental and physical disorders (e.g., Kobasa & Paccetto, 1983). People exposed to persistent stress often suffer from burnout (Dick, 1992). Burnout is a general phenomenon (Kim et al., 2017; Luo, Chen, & Wang, 2016), which may adversely affect academic performance (e.g., Oyoo et al., 2020) and may create psychological distress and strain (e.g., Aguayo, Cañadas, & Assbaa-Kaddouri, 2019). This problem is especially severe among children and adolescents in Eastern Asia (e.g., China, Korea), due to excessive stress and pressure towards high-school and college entrance examination (Lee, Puig, & Lee, 2013). The challenges of academic burnout are particularly significant in China, one of the world's most populous countries (Liao, 2013). Therefore, it is important to identify specific stressors associated with academic burnout among Chinese adolescents, in the hope of preventing or diminishing the negative outcomes of burnout through intervention toward specific stressors (e.g., stress from academics, parental relationships, teacher relationships, peer relationships).

Chinese Education Background

In China, limited educational resources (e.g., differences in educational resources between schools and regions) have yielded an intensely competitive academic context for adolescents at middle and high school levels (Martin & Hau, 2010). Adolescents immersed in such an intensely disadvantaged academic context often abandon leisure

activities to spend more time focusing on earning better exam results (Liu & Platow, 2020), leading to significant problems in academic stress and burnout (Luo, Chen, & Wang, 2016). In addition, students in Grades 8 have nearly completed nine years of compulsory education according to the People's Republic of China's "Compulsory Education Law". Not all students are able to go to high school after graduating from Grade 9, depending on their results in the high school entrance examination. Some students without strong exam results (around 50%) will not enter high school but instead attend vocational school. Students graduating from vocational school face more stereotypes in job hunting, and this results in loss of status for both parents and the student (Yu, Wang, & Li, 2013).

For strong results on the high school entrance examination, at school during the day, Chinese students' time is filled with classes and studying. Chinese middle school students need to arrive at school at 7:00 a.m. and leave at 6:00 p.m. They have one morning self-study class, 8 classes (each 45 minutes) and one evening self-study class every day, and there is only 10 minutes between classes. After they leave school, they need to complete their homework at home. On weekends, their time will be spent finishing homework and attending extra tutoring to improve their grades (Gao, 2016).

This study examined Grade 8 Chinese students in July 2023, as they would be facing their first critical and stressful examination in June 2024, which determined the direction of their life trajectory. Considering the immense pressure to succeed, the risk of academic burnout, and the impact on academic performance (e.g., Oyoo et al., 2020), this time period is critical to study.

Literature Review

This section will discuss the definition, theory, and history of academic burnout.

The related theories and previous research about the relation between stress and academic burnout will be introduced, followed by a discussion of the differential impact from academic stress and interpersonal stress on academic burnout. Next, the role of a potential moderator (academic coping) between academic stress and academic burnout will be considered. Finally, age, sex, socio-economic status, and grade will be discussed as these are control variables in this study.

Academic Burnout

The term “burnout” refers to a psychological syndrome arising from chronic stress, which began to be studied in the mid-1970s with a focus on stress in the workplace (Freudenberger, 1974). Maslach and Jackson (1998) proposed the most widely accepted three-factor model of burnout: emotional exhaustion, cynicism (or depersonalization), and inefficacy (or low personal accomplishment). Specifically, emotional exhaustion describes the depletion of emotional resources and a lack of energy arising from the pressure of achieving excellence. Cynicism refers to a condition in which people are not able to excel as expected, and they tend to become indifferent and develop a cynical attitude towards work. Inefficacy refers to the perception of inadequacy and a lack of competence in the performance of work (Maslach & Jackson, 1998).

Initially, research on burnout focused on people who worked in social human service workers, for example, teachers and nurses, where there is substantial

interpersonal interaction between themselves and the people they are helping (Skaalvik & Skaalvik, 2010; Vahey et al., 2004). Next, burnout was considered in other groups, for example, business people (Gryskiewicz & Buttner, 1992), and professional soldiers (Leiter, Clark, & Durup, 1994). More recently, researchers (Oyoo et al., 2020; Aguayo et al., 2019) investigated burnout experienced by high school and undergraduate students, as it is argued that the mandatory structured activities (e.g., attending classes and completing assignments) students often engage in can also be considered as “work” (Schaufeli & Taris, 2005).

Academic burnout refers to severe psychological distress with the result of continued failure in coping with stress in an academic setting (Schaufeli et al., 2002). Academic burnout can lead to serious physical and psychological negative consequences for students. Research has shown that the consequences may be physical (e.g., lack of sleep, fatigue) (Aguayo, Cañadas, & Assbaa-Kaddouri, 2019), emotional (e.g., depression, dissatisfaction with studies, and lack of well-being and life satisfaction) (Rios-Risquez et al., 2018; Fiorilli et al., 2017), or behavioral (e.g., low academic performance and achievement, disengagement from class activities, irregular class attendance, dropping out) (Oyoo et al., 2020; Yang & Farn, 2005).

Therefore, given that burnout arises from frequent and prolonged stress (Kobasa & Paccetto, 1983), the removal of causal stress would eradicate the level of burnout (Tavellaa & Parker, 2020). The current study seeks to understand which type of stress would predict academic burnout among Chinese adolescents, in the hope of informing future interventions.

Stress and Academic Burnout

Previous research about burnout among workers has shown that occupational stress predicts burnout in the workplace (Brewer & McMahan, 2003; Lee & Ashforth, 1996). For individuals who face excessive stressors at work, job performance can be affected, leading them to fail to achieve their aim and experience burnout (Khattak et al., 2011). Similarly, research on academic burnout has also shown that the correlation between a student's general stress level and academic burnout is significant (Lin & Huang, 2014). The current study, to my knowledge, is the first to explore the impact of four types of students' stress (stress from academics, stress from peer relationships, stress from parental relationship, stress from teacher relationships) on academic burnout in one integrated model, and the first to explore this topic under Chinese education background.

Stress from Academics

Stress from academics is the main type of stress that adolescents endure in their daily life (Fulgini, 2004), and it is a significant contributor to a variety of negative outcomes (e.g., Cadime et al., 2016). Su et al. (2011) developed the Educational Stress Scale for Adolescents (ESSA), which extended the range of factors that contributed to academic stresses among Chinese adolescents. The five factors of ESSA include: pressure to study (e.g., too much pressure in daily studying), workload (e.g., too much homework or exams), worry about grades (e.g., overemphasis on the role of the grade in determining one's whole life), self-expectation (e.g., feeling stressed when not living up to one's own expectations), and despondency (e.g., lack

confidence with exam results).

Previous research found that stressors from academics (e.g., time spent studying, extensive homework, difficulties understanding schoolwork, and failure in examinations) were the most frequently reported stressors related to academics and burnout (Sharififard et al., 2020; Veyis et al., 2019; Liu, 2009; Chen, 2006). Therefore, stress from academics is a potential cause for students' academic burnout considered in the current study.

Stress from Interpersonal Relationships

The person-environment fit theory emphasizes the mutual relationship between individuals and the environment (Lewin, 1935). The environment creates behavioral and emotional responses in a person and the person's responses impact the environment (Caplan & Harrison, 1993). For adolescents, good person-environment fit can enhance positive responses from the environment (e.g., campus, home) which may support an adolescent's need for being valued and their sense of belonging; ultimately this will manifest in their positive development and good mental health (Waters et al., 2009). This person-environment fit theory provides a theoretical basis for understanding the potential effect of interpersonal stress on adolescents' negative outcomes (Karimi & Fallah, 2019; Sakiz et al., 2012).

Moreover, previous research also indicated that it is important for adolescents to interact with those around them to acquire self-affirmation and social support (Shi, 2004). Adolescents who fail to establish and maintain significant interpersonal relationships can feel stressed and anxious, and this can increase the likelihood of

burnout and negative academic performance (Lin & Huang, 2014). A meta-analysis conducted by Kim et al. (2017) argued that there is a negative relationship between perceived interpersonal support (e.g., teacher, parents, peer support) and academic burnout. In other words, students who lacked interpersonal support felt a higher level of academic burnout. Therefore, in the current study, interpersonal stresses are considered potential causes of academic burnout. Interpersonal stressors include stress from interpersonal relationships with parents, teachers, and peers.

Stress from Teacher Relationships

Specifically, for interpersonal relationships with teachers, most research has focused on the positive role of teacher support related to preventing academic burnout. Teacher support in academic settings was shown to improve students' academic efforts, engagement, and participation in academic task and activities (Wentzel, 1997; Connell & Wellborn, 1991), and significantly decrease academic burnout (Karimi & Nasser, 2019; Kim et al., 2017). Because teachers are well-trained in helping students to deal with academic issues and stresses, support from teachers may be more practical and helpful in providing efficient encouragement and care than support from parents and peers (Kim et al., 2017). By contrast, it stands to reason that a lack of caring and support from teachers would lead to negative outcomes (e.g., burnout) among adolescents. Research (Karimi & Nasser, 2019) has shown that students without positive relationships with teachers will receive less teacher support, which results in lower expectations, encouragement, value, and respect by teachers. This suggests that failing to establish positive relationships with teachers could be regarded

as stressful for adolescents. Thus, stress from relationships with teachers may be considered a potential type of interpersonal stress.

Stress from Parental Relationships

Adolescents' perceived stress from parental relationships has also been shown to be a significant predictor of academic burnout. Previous research has indicated that the quality of parental attachment determines individuals' emotion regulation and coping with stressors and strain (e.g., burnout) (Bartholomew & Horowitz, 1991; Bowlby, 1969). Insecure parental attachment (e.g., high levels of alienation, or/and low level of trust and communication) resulted in severe academic burnout among Chinese adolescents (An et al., 2018). This suggests that parental attachment would affect adolescents' levels of stress and burnout. In addition, adolescents' negative relationship with parents (e.g., being ignored, being excessively controlled) increases their level of strain and depression, which in turn affects their academic performance (Davey et al., 2018; McDaniel et al., 2018). For example, research about mother 'phubbing' (i.e., mother spends a lot of time on her smartphone and ignores or refuses to meet their child's needs during mother-child interactions) found that it significantly and positively predicted academic burnout among Chinese high school students, and being 'phubbed' was considered as a chronic daily stressor for adolescents (Bai et al., 2019). Chen (2006) indicated that excessive control from parents was also a causal factor of students' burnout. These findings of mother 'phubbing' and parents' excessive control suggest that a positive relationship with parents is important for Chinese adolescents. Negative relationships with parents may be considered as

stressors and may affect adolescents' feelings (burnout) and performance in academics. Therefore, stress from parental relationship (e.g., alienation, ignorance, excessive control) may also be a potential interpersonal stressor leading to adolescents' academic burnout.

Stress from Peer Relationships

Despite the importance of teachers and parents in adolescence, relationships with peers gradually become more important as children grow older (Lin & Huang, 2014). Previous research has indicated a positive relationship between stress from peer relationships and academic burnout. School incivility contributes to adolescents' negative psychological and academic outcomes (e.g., academic burnout; Bai et al., 2019). Being excluded and experiencing school bullying or cyberbullying were also frequently reported by adolescents who suffered burnout syndrome (Chen, 2006). Low levels of perceived peer support predicted high levels of academic burnout (Kim et al., 2017). These findings suggest that adolescents' negative relationship with peers (e.g., school incivility, exclusion, bullying, low peer support) could be a perceived as a stressor and result in academic burnout. Thus, the current study considered stress from peers as a potential cause of academic burnout.

The Moderating Role of Adaptive Academic Coping

Coping refers to individuals' cognitive and behavioral efforts to manage the internal and external demands that are created by stress (Noh et al., 2016; Folkman et al., 1986). Adaptive academic coping involves coping strategies that not only protect children and youth from the harmful effects of academic stress but also contribute to

their success, growth, and positive development (Skinner, Pitzer, Steele, 2013).

Researchers have indicated that adaptive academic coping helps children and adolescents to relieve and manage the negative impact of chronic daily stresses from academic work (Skinner, Pitzer, & Steele, 2013). Adaptive academic coping was positively correlated with competence, academic resilience, academic engagement, and achievement (Pitzer & Skinner, 2017; Martin et al., 2010; Martin & Marsh, 2008). When confronted with stress from academics, students with effective academic coping could manage and decrease the negative impact from academic stress and be more resilient, making them less likely to feel strain and burnout from stressors. However, academic coping may only be an effective approach for dealing with stress from academics but not interpersonal stress, as it is specific in dealing with academic stressful events (e.g., schoolwork, examination). Thus, it is hypothesized that adaptive academic coping may be a significant moderator for the relationship between academic stress and academic burnout, but not significant in moderating the relationship between interpersonal stress and academic burnout. To be more specific, confronted with stress from academics, adolescents with weaker adaptive academic coping are more likely to have higher levels of academic burnout. But for those adolescents with stronger adaptive academic coping, their academic burnout led by stress from academics would be much lower.

The Current Study

In the current study, a model was proposed in which academic burnout is an outcome of both stress from academics and stress from interpersonal relationships,

and adaptive academic coping moderates the relationship between stress from academics and academic burnout among adolescents. To test this model, I examined stress from academics and interpersonal relationships, academic burnout, and adaptive academic coping. The hypotheses of the current study are: 1) stress from academics and stress from interpersonal relationships (i.e., stress from teacher relationships, stress from parental relationships, stress from peer relationships) positively predict academic burnout, and 2) academic coping moderates the relationship between stress from academics and academic burnout (See Appendix A, Figure 1, p. 42).

Methodology

Participants and Procedure

The current study acquired clearance from Brock University's Research Ethics Board (File: 22-332 - CHALMERS) and the Headmaster's permission from a middle school in the Economic and Development Zone, Yantai, China before data collection. The study and its purpose were introduced to Grade 8 students' head teachers. The head teachers of each classroom provided consent for their students to participate in the study and signed a consent form. Parental consents were not collected in this study because within Chinese educational system, the students' head teachers have the power to decide whether their students can participate in any activity (e.g., this study) during school day. Participants were Grade 8 volunteer students recruited from this school on July 15th and 16th, 2023. At that time, students had just completed their final exams of the semester and were awaiting their school grades.

The purpose of this study and consent were introduced to students. Three points on

the consent form were highlighted: first, that their answers would be kept strictly confidential, and that their headmaster and teachers will not know any of their answers; second, that they could withdraw at any time during the questionnaire-filling process and would not receive any consequences; third, participants were asked to read the consent form by themselves and if they still wanted to participate in the research, they needed to sign the consent form and go to a lecture theatre to answer the questionnaire, if not, they could stay in the classroom and continue their school work.

A paper-and-pencil questionnaire was distributed in a quiet classroom (see Appendix B, p. 43 for the questionnaire). The average duration of the time to complete the questionnaire was 15 minutes. Participants began by responding to demographic questions (e.g., age and sex, socio-economic status, grade ranking), then answered questions assessing stress from academics and interpersonal relationships (e.g., peers, teachers and parents), academic burnout, and adaptive academic coping. There were 723 Grade 8 students being introduced and invited to participate in the research. There were 518 students who signed the consent and answered the questionnaire, with 250 (48.26%) males and 268 (51.73%) females. The mean age was 14.59 years ($SD = 0.24$).

Measures

The questionnaire contained six sections, as outlined below. Each section was counter-balanced to reduce the potential impact of missing data and order effects (Norman et al., 2018).

Demographics. The first part of the questionnaire posed questions related to sex, age, socio-economic status (SES), and Grade Ranking. Socioeconomic status included two items, they were “The highest education background of your mother” and “The highest education background of your father”. Five options were provided (elementary school, junior high school, senior high school, vocational school, bachelor degree or higher), and responses were coded from 1 to 5 in the order presented. A composite of SES was created by averaging these two items. Grade ranking included one item, asking about the average grade ranking received in their most recent 3 exams; five options were provided (top 10%, 20-40%, 40-60%, 60-80%, 80-100%). Higher scores indicated lower grade ranking.

Stress from academics. Stress from academics was measured with the Educational Stress Scale for Adolescents (ESSA; Sun et al., 2010). The scale was developed and validated in the study conducted by Sun et al. (2010) with more than 2,000 adolescents (the age of the sample ranged from 12 to 18; $M= 15.37$, $SD= 1.69$) from urban and rural areas of Shandong, China. The scale included 5 sub-scales (pressure from studying, workload, worry about grades, self-expectation, despondency), and consists of a total of 16 items. Sample items include, “I feel a lot of pressure in my daily studying”, “I feel stressed when I do not live up to my own standards”, and “Academic grade is very important to my future and even can determine my whole life”. Participants responded to each item on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) with a higher score indicating greater academic stress. In this study, Cronbach’s alpha was .897 for the total scale, and the

Cronbach's alphas for each subscale were .880 (Pressure from studying), .886 (Workload), .783 (Worry about grades), .845 (Self-expectation), and .633 (Despondency). No items were reverse coded. For stress from academics, I created composites by taking an average of items for each of the five subscales. For the purpose of reporting means and correlations, subscales were averaged.

Stress from peer relationships. Stress from peer relationships was measured with the Interpersonal Stress Scale (ISS; Matsushima, & Shiomi, 2003). The questionnaire was validated by Matsushima and Shiomi (2003) in a sample of 180 Japanese high school students. The scale has three subscales (Interpersonal Conflict, Interpersonal Inferiority, and Interpersonal Dislocation), and each subscale includes 10 items. The current study did not use Interpersonal Inferiority and Interpersonal Dislocation subscales as they did not fit the peer condition of Chinese adolescents therefore, the current study only used the Interpersonal Conflict subscale to assess "stress from peer relationship". This sub-scale included items exploring how often students experienced various incidents of stress from peers, such as "I had a quarrel with my friends" and "I was misunderstood by my friends". Participants responded to each item on a 4-point Likert scale (1 = never experienced, 5 = often experienced) with a higher score indicating greater stress from peers. The scale was independently translated by me and a graduate student in English education from Beijing Normal University using the standard forward-translation and back-translation procedure based (Campbell et al., 2017). In this study, Cronbach's alpha was .695. No items were reverse coded. For the

purpose of reporting means and correlations, a composite score was created by averaging the ten items.

Stress from parental relationships and stress from teacher relationships. Stress from parental relationships and teacher relationships were measured with the Chinese version of Adolescent Stress Questionnaire (ASQ-CN; Ye et al., 2018). The questionnaire was validated by Ye et al. (2018) in a sample of Chinese middle school students ($N = 420$), and the age range was 13 to 16 years ($M = 14.71$, $SD = 1.61$). There were 5 sub-scales included in the questionnaire (Stress of getting along with others, Stress of academic future uncertainty, Stress of school/leisure conflict, Stress of daily life, Stress of parental authority and emerging autonomy). Participants responded to each item on a 5-point Likert scale (1= not at all stressful, 5= very stressful), with a higher score indicating greater interpersonal stress. Ye et al. (2018) indicated that items in a sub-scale (5 items) labeled “Stress of parental authority and emerging autonomy” reflected parent-child relationships thus I used them to assess “stress from parental relationship”. Sample scale items include “Not being taken seriously by your parents” and “Disagreements between you and your father”. In this study, Cronbach’s alpha of “stress from parental relationship” was .788. For stress from parental relationships, for purposes of reporting means and correlations, I created a composite by averaging the five items. In addition, I selected 4 additional items from the ASQ-CN besides the subscale “Stress of parental authority and emerging autonomy”, which are all correlated with stress from relationships with teachers to assess “stress from teacher relationships”. Items were “Not being listened

by teachers”, “Usually being ignored by teachers in class”, “Difficult to getting along with your teachers” and “Disagreements with you and your teachers”. In this study, Cronbach’s alpha of “stress from teacher relationships” was .743. Thus, all items of the ASQ-CN were answered by participants, but only one subscale (Stress of parental authority and emerging autonomy) and four items selected from other 4 subscales (besides “Stress of parental authority and emerging autonomy”) were used in data analysis. For the purpose of reporting means and correlations, a composite score was created by averaging the four items.

Academic Burnout. Academic burnout was measured with the Chinese version of the Maslach Burnout Inventory–Student Survey (MBI-SS; Wu et al., 2010). The questionnaire was validated by Wu et al. (2010) in a sample of Chinese middle school students (N = 1023), and the age range was 12 to 15 years. The scale includes 3 sub-scales (exhaustion, cynicism, and self-efficacy), and consists of 18 items. Sample items are, “I feel used up after I complete my learning task every day”, “I feel burned out in recent days”, “I have less sense of accomplishment from studying”. Participants responded to each item on a 5-point Likert Scale (1 = strongly disagree, 5= strongly agree). Higher scores reflect a higher degree of academic burnout. In this study, Cronbach’s alpha was .862 for the total scale, and Cronbach’s alphas of each subscale were .823 (exhaustion), .808 (cynicism), and .837(self-efficacy). For academic burnout I created composites by taking an average of items for each of the three subscales. Then, for purpose of reporting means and correlations, the subscales were averaged.

Adaptive Academic Coping. An academic coping scale (ACS; Skinner et al., 2013) was used to measure adaptive academic coping. The scale was developed and validated in the study conducted by Skinner et al. (2013) with Grade 3-7 American students. The scale included 5 sub-scales of adaptive academic coping and 6 sub-scales of maladaptive academic coping, each sub-scale includes 5 items. Considering the current study is only interested in adaptive academic coping, only the adaptive sub-scales (i.e., strategizing, help-seeking; comfort-seeking; self-encouragement; commitment) were included. Sample items include “When something bad happens to me in school, I talk about it with someone I’m close to”, “When something bad happens to me in school, I try to figure out how to do better next time”. Participants responded to each item on a 5-point Likert Scale (1 = “strongly disagree”, 5= “strongly agree”). Higher scores reflect a higher degree of adaptive academic coping. The scale was translated by me and a graduate student in English education from Beijing Normal University. The standard forward- and back-translation procedure was used. In this study, Cronbach’s alpha was .907 for the total scale, and Cronbach’s alphas of each subscales were .823 (strategizing), .842 (help-seeking), .863 (comfort-seeking), .716 (self-encouragement), and .825 (commitment). For adaptive academic coping I created composites by taking an average of items for each of the five subscales. Then, for the purpose of reporting means and correlations, each subscale was averaged.

Statistical Analyses

In the current study, missing data were less than 0.94%. Therefore, based on the

recommendation of Little and Rubin (2002), missing data were replaced by multiple imputation values. Using the Multiple Imputation function in SPSS version 23 (IBM Corp., 2015), the results were pooled across five iterations.

Descriptive analyses (i.e., mean, standard deviation, correlations) were performed among the variables using SPSS 23 (See Appendix C, p. 45). Then, by utilizing structural equation modeling (SEM) in Mplus7.0 (Preacher, Zhang, & Zyphur, 2011), the measurement models were examined to ensure the data fit well. Average scores of five subscales of ESSA loaded on to the latent factor stress from academics, ten item scores of ISS loaded on to the latent factor stress from peers relationship, five item scores of ASQ-CN loaded on to the latent factor stress from parental relationship, four item scores of ASQ-CN loaded on to the latent factor stress from teacher relationships, average scores of three subscales of MBI-SS loaded on to the latent factor academic burnout, and average scores of five subscales of ACS loaded on to the latent factor adaptive academic coping. Next, the direct relationship between stressors (stress from academics; stress from peer, teachers, parental relationships) and academic burnout were examined; maximum likelihood estimation (Schumacker & Lomax, 2004) was applied to test the significance (Preacher & Hayes, 2008). Because the outcome variable in my model was academic burnout, demographic variables that may be correlated with this outcome were controlled for in analyses. There were four demographic variables related to academic burnout: sex (Zahed et al., 2014; Michaeli et al., 2014), age (Kim et al., 2014; Lee et al., 2013; Salmela-Aro et al., 2009), socio-economic status (SES; Toutkoushian & Curtis, 2005), and grade ranking

(Salmela-Aro, Kiuru, & Nurmi, 2009). These demographic controlled for by including them as co-variates in the model. Then, to examine the moderating role of adaptive academic coping between stress from academics and academic burnout, latent moderated structural (LMS) equations approach was applied, which is best used when the moderator is a multi-item latent variable (Kelava et al., 2011).

Results

The results section evaluated the proposed model, in which stress from academics and stress from teacher, parental, and peer relationships predicted academic burnout, and adaptive academic coping moderates the relationship between stress from academics and academic burnout among Chinese adolescents.

Descriptive Analyses

The means, standard deviations, and bivariate correlations for the variables used in this study are displayed in Table 1 (see Appendix C, p. 48). Results indicate that stress from academics and stress from relationships with peers, parents and teachers were all positively correlated with academic burnout. As expected, the associations between adaptive academic coping and stress from academics, and the associations between adaptive academic coping and academic burnout were negative. The independent variables, moderators, and dependent variables were significantly correlated. As for the control variables, the relationship with sex, age, and grade ranking and academic burnout were significant but the relation between SES and academic burnout was not significant. Male and female means and standard deviations for the variables used in this study are displayed in Table 2 (see Appendix

D, p. 49).

Measurement Model

The measurement model for six latent variables (stress from academics, stress from peer relationships, stress from parental relationships, stress from teacher relationships, academic burnout, adaptive academic burnout) was tested, with the structural equation modeling (SEM) results showing acceptable data fit ($\chi^2 = 3437.277$, $df = 271$, $p < .001$, CFI = 0.893, TLI = 0.921, RMSEA = 0.072, SRMR = 0.031). Items loaded onto their respective latent factors, and the majority of loadings were greater than the suggested value 0.5 (Fornell & Larcker, 1981).

Main Analyses

As shown in Figure 2 (See Appendix E, p. 50), the relationships between stresses (stress from academics, stress from peer relationships, stress from parental relationships, stress from teacher relationships) and academic burnout were first tested, with structural equation modeling (SEM) results showing acceptable data fit ($\chi^2 = 5999.585$, $df = 335$, $p < .001$, CFI = 0.907, TLI = 0.912, RMSEA = 0.068, SRMR = 0.042). Results showed that stress from academics ($\beta = 0.524$, $p < .001$) and stress from parental relationships ($\beta = 0.309$, $p < .001$) significantly predicted academic burnout after controlling for the effects of sex ($\beta = 0.057$, $p = 0.095 > .05$), age ($\beta = 0.031$, $p = 0.354 > .05$), SES ($\beta = 0.053$, $p = 0.126 > .05$) and grade ranking ($\beta = 0.260$, $p < .001$). However, the predicting role of stress from peer relationships ($\beta = 0.125$, $p = 0.085 > .05$) and stress from teacher relationships ($\beta = 0.099$, $p = 0.323 > .05$) to academic burnout were not significant.

Moderating Analyses

Next, the moderation model was tested. The latent moderated structural equation analyses was used to estimate the latent interaction effect of stress from academics and adaptive academic coping on academic burnout. The results show that the interaction effect (stress from academics \times adaptive academic coping) on academic burnout was significant ($\beta = -0.063$, $p = 0.039 < 0.05$) after controlling for the effects of sex ($\beta = 0.008$, $p = 0.713 > .05$), age ($\beta = 0.005$, $p = 0.624 > .05$), SES ($\beta = -0.015$, $p = 0.495 > .05$) and grade ranking ($\beta = -0.011$, $p = 0.503 > .05$) (See Table 3, Appendix F, p. 51). To better explain the model, the adaptive academic coping is divided into high score group (M+1SD) and low score group (M-1SD) to do simple slope test (See Figure 3, Appendix G, p. 52). Results shown that for students with **high** adaptive academic coping, stress from academics negatively predicted academic burnout ($\beta = 0.428$, $p < 0.01$). For students with low adaptive academic coping, stress from academics negatively predicted academic burnout ($\beta = 0.675$, $p < 0.01$). Thus, adaptive academic coping significantly moderated the relationship between stress from academics and adaptive academic coping .

Discussion

A large body of evidence suggests that burnout is a general phenomenon in the intensively competitive educational culture in China (e.g., Luo, Chen, & Wang, 2016), and that it is particularly disadvantageous for academic performance and psychological health of adolescents (e.g., Oyoo et al., 2020; Aguayo, Cañadas, & Assbaa-Kaddouri, 2019). Considering stress is a significant antecedent factor for

burnout (Dick, 1992), the current study sought to identify the relation between specific stressors and academic burnout among Chinese adolescents. In the conceptual model academic burnout was predicted, at least in part, by students' four types of stressors (academics, peer relationships, parental relationships, teacher relationships). Moreover, it was hypothesized that the relation between stress from academics and academic burnout would be moderated by the students' adaptive academic coping. This model was tested with a sample of Chinese Grade 9 and 10 students. Analyses provided support for the model when considering stress from academics and stress from parental relationships, but not stress from peer relationships and stress from teacher relationships. Adaptive academic coping was significant in moderating the relationship between stress from academics and academic burnout. The implications of these findings are discussed below.

The Impact of Stress from Academics on Academic Burnout

It is well documented that stress from academics is related to academic burnout. This study's findings were consistent with earlier research which found that most of Chinese middle school students reported stresses from excessive academic work as an influential factor in perceived academic burnout (Liu, 2009) as students suffering burnout were bothered by heavy academic tasks and examinations (Chen, 2006), and academic stress negatively correlated with personal wellness and intrinsic motivation (Coelho, Augusto, Lages, 2011) but positively correlated with burnout (Vidhukumar & Hamza, 2020). Hish et al. (2019) reported academic stress as the most predictive of burnout. Jung et al. (2015) explained that when students are

overwhelmed by their excessive academic workload and too much worry and pressure about grades and study and having the sense of inadequacy and incompetence from negative feedback about an exam grade, they may lose interest and/or experience burnout. Instead, it may be possible to lower superfluous academic stress by reducing unnecessary workload, psychological pressure about self-expectation, and overestimation about the importance of exam grades in one's whole life to reduce burnout. Fostering psychological support, sufficient breaks, and a less competitive learning environment may also improve students' intrinsic motivation, well-being, and prevent them from developing burnout (Yusoff et al., 2021).

The Impact of Stress from Parental Relationship on Academic Burnout

Results of this study showed that stress from parental relationships positively predicted academic burnout, that is, the higher the stress from parental relationships, the higher the academic burnout Chinese adolescents perceived. This suggested that stress from a negative relationship with parents is a risk factor for academic burnout. This study's result was also consistent with previous research findings indicating that negative parent-child relationships arouse intergeneration conflict, which adversely affected children's behavioral, emotional, and academic adjustment (Conger, Conger, & Martin, 2010; Vandewater & Lansford, 2005). Previous studies also showed that high levels of alienation, neglect, and control from parents were considered chronic daily stressors from parents by adolescents, and this significantly predicted academic burnout (e.g., Bai et al., 2019; An et al., 2018; McDaniel et al., 2018; Davey et al., 2018; Chen, 2006). Traditional Chinese culture is rooted in Confucianism that greatly

emphasizes social hierarchy and “filial piety”; Chinese parents are in a dominant status in the family. Controlling and high-power parenting are typically associated with parental care and warmth, and children are educated to be respectful and obedient to parents (Shih, 2015; Chao, 1994). For adolescents, the culture of obedience leads parents to ignore adolescents’ personal opinions and affections (Tang, 2006); it is difficult to communicate with parents without respect and an equal atmosphere. This could be an added stressor for these adolescents. Thus, those with high levels of stress from parental relationships, they may not be able to freely discuss challenges, pressures, or worries about their academics with parents. They may have fewer solutions to their learning difficulties without psychological support from parents (Chen, 2006).

The Impact of Stress from Teacher Relationships on Academic Burnout

The results of this study demonstrated that stress from student-teacher relationships does not significantly predict academic burnout. This finding was not consistent with previous research in the western world in which teacher supports improved students’ academic efforts, engagement and participation in academic tasks and activities, and decreased academic burnout (Karimi & Nasser, 2019; Kim et al., 2017).

Considering the Chinese educational context, possible explanations may be that students perceive less stress from a weakened personal relationship with teachers. As noted in the introduction, 14-15 year old adolescents are preparing for the high school entrance examination, thus their time in school is filled with classes, studying, and

simulated tests. Generally, there are more than 50 students in one class and teachers do not have enough time and energy to get to know each student well (Yang, 2007). As a result, these students have limited time to establish close relationships with teachers (Ruan & Deng, 2004). This means students in China have less time and opportunity to get to know their teachers, and may thus perceive less stress due to a weak teacher relationship.

Moreover, even if students perceive stress from a lack of teacher relationships, they may rationalize it (Deng & Jiang, 2018; Chen & Wu, 2016). In China, teachers are responsible for teaching knowledge in class and the assessing? grades students get in exams, while emotional support and mental health education are not considered necessary (Xu, Yang, & Jia, 2014). Teachers are focused on students' exam grades and support related to their education (e.g., learning methods), therefore, students do not expect to have a personal relationship with teachers. They would thus rationalize teachers' behaviours when they are being ignored and they might thus be emotionally unconcerned by teachers' actions (Deng & Jiang, 2018; Chen & Wu, 2016). Thus, in the current study, the low level of stress Chinese adolescents perceived from teacher relationships, and their rationalization of the lack of relationship, may explain the nonsignificant prediction of academic burnout.

The Impact of Stress from Peer Relationships on Academic Burnout

Results from this study showed that stress from peer relationships did not significantly predict academic burnout. This finding was not consistent with previous research suggesting that school incivility, being excluded, experiencing bullying, and

perceiving less peer support contribute to negative psychological and academic outcomes (e.g., academic burnout) (Bai et al, 2019; Kim et al., 2017; Chen, 2006).

Previous research focused on a Western cultural background. In this study, it was unexpected that the average score and standard deviation was low, indicating most participants chose “never experienced” and “hardly experienced” interpersonal conflict. This may suggest that the scale used to measure stress from peer relationships was not appropriate within a Chinese cultural context. For example, several participants reported to the researcher that items about peer relationships were irrational for them. For example, for items like “I was ordered to do an unreasonable thing by my friends” “I was looked down on by my friends” and “My opinion was different from my friends”, some participants indicated that it is impossible for them to make friends with those that treat them like this. Thus, it is possible that items in this scale did not measure Chinese adolescents’ stress from peer relationships.

Another potential explanation for this finding was that collectivism, a core traditional Chinese value, requires a high tolerance of others in the aim of establishing harmonious interpersonal relationships (Liu, Tein, & Zhao, 2004; Chiu, 1990). Conflicts with peers would be heavily criticized by parents and teachers for not being tolerant, tame, and kind, but good interpersonal relationships with peers would be highly praised and awarded. Therefore, Chinese adolescents’ conflicts usually appear in private form (e.g., online) but not head-on (Wang, 2013). Considering this reality, for self-protection, students may not admit to experiencing conflicts with peers when responding in a questionnaire.

Moreover, 14-15 year old Chinese adolescents have had a relationship with classmates and friends for three to four years and likely now have a stable social network (Du & Wang, 2009; Chen, 2006). Excessive studying on and off campus also limits their leisure time to socialize with peers (Liu & Platow, 2020). Thus, students may rarely have the time and opportunity to generate or pursue conflicts with peers in their daily lives.

The Moderating Role of Adaptive Academic Coping

Adaptive academic coping was found to significantly moderate the relation between stress from academics and adaptive academic coping. This result was consistent with previous research (e.g., Pitzer & Skinner, 2017; Skinner, Pitzer, Steele, 2013; Martin et al., 2010; Martin & Marsh, 2008). Skinner et al. (2013) indicated that the negative impact of chronic daily stress from academic work could be relieved and managed by adaptive academic coping. Many studies have also found that adaptive academic coping was positively correlated with competence, academic engagement, and achievement (Pitzer & Skinner, 2017; Martin et al., 2010), and students with these coping skills would be more resilient when facing stressors from academics (Martin & Marsh, 2008). Students with higher levels of adaptive academic coping skills and positive attributes (e.g., competence, academic resilience) could use these skills and attributes to alleviate stress and exhaustion from academics and reduced the level of perceived academic burnout. Thus, students with higher levels of adaptive academic coping would be less burnt-out when experiencing the same level of stress from academics as those with lower levels of adaptive academic coping.

Recommendations and Limitations

This study highlighted the role of stress from academics and stress from relationships in contributing to academic burnout among Chinese middle school students. First, based on the finding that stress from academics predicted academic burnout, I recommend that the Chinese government and educators (especially teachers) attend to the effect of stress from academics on adolescents. The government could introduce effective policies aimed at reducing students' time spent in school and limiting the amount of homework given in an effort to reduce students' academic workload. In July of 2022, General Office of the Central Committee of the Communist Party of China and General Office of the State Council published the "Opinions on Further Reducing the Burden of Homework and Off-campus Training for Students in the Compulsory Education Stage". This policy specified that middle students' homework from school should be limited to 90 minutes. If a student spends more than 90 minutes doing homework, they have the right to refuse to complete the remaining homework. This reflected the government's effort in reducing students' academic workload. However, several researcher indicated that controlling students' time spent on homework does not means reducing the workload of homework (Li, Wang, Huang, 2022). Considering students' differences in personal learning ability, knowledge proficiency, and writing speed, specifying students' time spend on homework may not be the best choice for reducing workload, and more practical rules should be considered (e.g. increase the proportion of students who can enter high school).

Second, schools and teachers could offer courses to teach students efficient strategies to cope with stress from academics (e.g., adaptive academic coping) to relieve perceived stress. In 2012, the Chinese government published “Guidelines for mental health education in primary and secondary schools”, and a mental health course (learning topics include skills to improve memory and imagination, how to deal with negative emotion, how to communicate effectively with parents and peers) is highly recommended. However, it is not usually conducted as a formal course in a large number of middle schools (Zhang, 2022; Huang, 2021). It is really important for schools and teachers to attach importance to this mental health course, and enable students to learn adaptive academic coping strategies.

Third, based on the finding that stress from parental relationships predicted academic burnout, Chinese parents should lower their controlling and high-power parenting style and learn to respect and provide more care and warmth to their children thereby reducing their children’s stress from parental relationships and reducing academic burnout. To change parents’ parenting style and educating methods, government and schools’ efforts are needed. In 2022, the Chinese government published “Family education promotion law”, in which family education is valued. Schools are asked to advertise healthy and scientific parenting styles, and teach parents effective parenting methods. More time to see the impact of such family education is needed.

This study is not without limitations. First, the data collected were cross-sectional, so the causal relationship implied in Figures 1 and 2 cannot be confirmed. It is

recommended that future research collect longitudinal cross-lag data using similar measures to those employed in this study. Second, this study sampled only Chinese students from one school in China, thus the standard deviations of some demographic variables (e.g., SES) were relatively low and their controlling role in the model was insignificant. It may well be that the proposed model being replicated in Chinese schools from other regions with greater SES variability may result in different findings. Third, the impact of stress from teacher and peer relationships on academic burnout was not significant, which was inconsistent with previous research (e.g., Bai et al, 2019; Kim et al., 2017). It may be possible that while the findings were non-significant, the role of stress from relationships may be meaningful to specific groups of adolescents, therefore, it is recommended that future research use qualitative research methods (e.g., interviews) to explore teacher and peer relationship stress in relation to academic burnout.

Conclusion

This study contributes to the literature on stress and academic burnout among Chinese students. Stress from academics and stress from parental relationships emerged as a significant predictor of academic burnout among Chinese middle school students, with adaptive academic coping playing a moderating role between the relationship between stress from academics and academic burnout. However, stress from teacher and peer relationships failed to emerge as a significant predictor of academic burnout. These findings imply that intervening and reducing stress from academics and stress from parental relationships may have the greatest impact in

reducing academic burnout.

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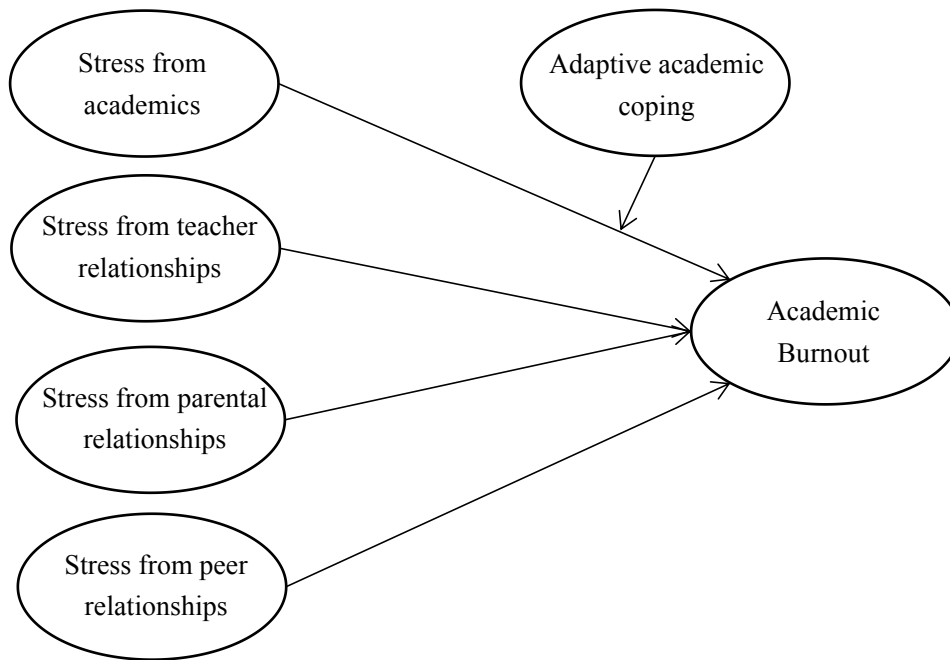
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Appendix A: Figure1. Hypothesis of the current study



Appendix B: Formal Questionnaire

Investigating on Learning of Chinese Middle School Students

Brock University, CHYS

Dear students,

Please read each items carefully, and answer as exactly as possible.

Please remember that:

- For all the items in this questionnaire, there are **no right or wrong answers**. You only need to choose the answer best suit to your situation.
- Your answer will be combined with other student's answer to calculate the average score. We will not identify individual, and your answer will be kept strictly confidential. **Your headmaster and teachers will not know any of your answers.**

1. Your gender is? Boy Girl
2. In what year were you born? 2004 2005 2006 2007 2008
3. What is your father's highest degree?
 - ①primary school
 - ②junior high school
 - ③senior high school
 - ④vocational school
 - ⑤bachelor degree or higher
4. What is your mother's highest degree?
 - ①primary school
 - ②junior high school
 - ③senior high school
 - ④vocational school
 - ⑤bachelor degree or higher
5. How many rooms are there in the house (or apartment) you are living? _____
6. What is your general grade ranking in recent 3 exams in the class?
 - ①top 10%
 - ②20-40%
 - ③40-60%
 - ④60-80%
 - ⑤80-100%
7. Please answer following items based on your current learning situation.
 - ①Strongly Disagree
 - ②Disagree
 - ③Neutral.
 - ④Agree
 - ⑤Strongly Agree

1	I feel a lot of pressure in my daily studying	①	②	③	④	⑤
2	There is too much competition among classmates that brings me a lot of academic pressure	①	②	③	④	⑤
3	Future education and employment bring me a lot of academic pressure	①	②	③	④	⑤
4	My parents care about my academic grades too much that brings me a lot of pressure	①	②	③	④	⑤
5	I feel there is too much homework	①	②	③	④	⑤
6	I feel that there is too much schoolwork	①	②	③	④	⑤
7	I feel that there are too many tests/ exams in the school	①	②	③	④	⑤
8	I feel that I have disappointed my teacher when my test/exam results are not ideal	①	②	③	④	⑤
9	I feel that I have disappointed my parents when my test/exam results are poor	①	②	③	④	⑤

10	Academic grade is very important to my future and even can determine my whole life	①	②	③	④	⑤
11	I feel stressed when I do not live up to my own standards	①	②	③	④	⑤
12	When I fail to live up to my own expectations, I feel I am not good enough	①	②	③	④	⑤
13	I usually cannot sleep because of worry when I cannot meet the goals I set for myself	①	②	③	④	⑤
14	I always lack confidence with my academic scores	①	②	③	④	⑤
15	I am very dissatisfied with my academic grades	①	②	③	④	⑤
16	It is very difficult for me to concentrate during classes	①	②	③	④	⑤

8. Please answer following items based on your current learning situation.

- ①strongly irrelevant ②irrelevant ③slightly relevant ④relevant
⑤extremely relevant

1	The competition with my peers for grades is quite intense	①	②	③	④	⑤
2	The unrealistic expectations of my parents stress me out	①	②	③	④	⑤
3	Examination times are very stressful to me	①	②	③	④	⑤
4	I think that my worry about examinations is weakness of character	①	②	③	④	⑤
5	My teachers are critical of my academic performance	①	②	③	④	⑤
6	I believe that the amount of work assignment is too much	①	②	③	④	⑤
7	The size of the curriculum (workload) is excessive	①	②	③	④	⑤
8	Even if I pass my exams, am worried about being admitted to high school	①	②	③	④	⑤
9	The examination questions are usually difficult	①	②	③	④	⑤
10	Am confident that I will be successful in my future career	①	②	③	④	⑤
11	Am confident that I will be a successful student	①	②	③	④	⑤
12	I fear failing courses this year	①	②	③	④	⑤
13	I can make academic decisions easily	①	②	③	④	⑤
14	I have enough time to relax after study work	①	②	③	④	⑤
15	The time allocated to classes and academic work is enough	①	②	③	④	⑤
16	Teachers have unrealistic expectations of me	①	②	③	④	⑤
17	Examination time is short to complete the answers	①	②	③	④	⑤
18	Am unable to catch up if getting behind the learning process	①	②	③	④	⑤

9. Please answer following items based on your current learning situation.

- ①Strongly Disagree ②Disagree ③Neutral. ④Agree ⑤Strongly Agree

1	I feel emotionally drained by my studies	①	②	③	④	⑤
2	I feel used up after I complete my learning task every day	①	②	③	④	⑤
3	I feel burned out in recent days	①	②	③	④	⑤
4	I usually feel tired at school	①	②	③	④	⑤
5	I am so poor in studying, I want to give it up	①	②	③	④	⑤
6	I think I cannot understand my schoolwork anyway, it doesn't matter whether I learn or not	①	②	③	④	⑤
7	I have less sense of accomplishment from studying	①	②	③	④	⑤

8	I doubt the significance of my studies	①	②	③	④	⑤
9	I have become more cynical about the potential usefulness of my studies	①	②	③	④	⑤
10	I usually throw myself into studying	①	②	③	④	⑤
11	I usually achieve the study goals I set by myself	①	②	③	④	⑤
12	When I am studying, I ignore everything around me	①	②	③	④	⑤
13	I can handle the exam well	①	②	③	④	⑤
14	I can effectively solve the problems that arise in my studies	①	②	③	④	⑤
15	I can always cope with learning problems easily	①	②	③	④	⑤
16	I can easily grasp what I have learned	①	②	③	④	⑤

10. Please answer following items based on your current interpersonal situation.

①Never Experienced ②Sometimes Experienced ③Often Experienced ④ Always Experienced

1	I was ordered to do an unreasonable thing by my friends.	①	②	③	④
2	I had a quarrel with my friend.	①	②	③	④
3	I was blamed by my friends.	①	②	③	④
4	I was looked down on by my friends.	①	②	③	④
5	My friends behaved irresponsibly.	①	②	③	④
6	I was misunderstood by my friends.	①	②	③	④
7	My friends made a wry face at me.	①	②	③	④
8	I was told the same thing many times by my friends.	①	②	③	④
9	My opinion was different from my friends.	①	②	③	④
10	I wasted my time releasing the stress of my friends.	①	②	③	④

11. Please answer following items based on your current learning and interpersonal situation.

①Strongly Disagree ②Disagree ③Neutral ④Agree ⑤Strongly Agree

1	Not having enough time for your boy/girl-friend	①	②	③	④	⑤
2	Getting along with your boy/girlfriend	①	②	③	④	⑤
3	Breaking up with your boy/girlfriend	①	②	③	④	⑤
4	Making the relationship with your boy/girlfriend	①	②	③	④	⑤
5	Teachers hassling you about the way you look	①	②	③	④	⑤
6	Not being listened to by teachers	①	②	③	④	⑤
7	Lack of respect from teachers	①	②	③	④	⑤
8	Lack of trust from adults	①	②	③	④	⑤
9	Lack of freedom	①	②	③	④	⑤
10	Lack of understanding by your parents	①	②	③	④	⑤
11	Disagreements between you and your peers	①	②	③	④	⑤
12	Parents hassling you about the way you look	①	②	③	④	⑤
13	Arguments at home	①	②	③	④	⑤
14	Admission by a good high school	①	②	③	④	⑤

15	Concern about your future	①	②	③	④	⑤
16	Other relatives except your parents expecting too much from you	①	②	③	④	⑤
17	Keeping up with the school work	①	②	③	④	⑤
18	Difficulty with some subjects	①	②	③	④	⑤
19	Parents expecting too much from you	①	②	③	④	⑤
20	Teachers expecting too much from you	①	②	③	④	⑤
21	Not getting enough timely feedback on schoolwork	①	②	③	④	⑤
22	Not having enough time for fun	①	②	③	④	⑤
23	Not enough time for activities outside of school hours	①	②	③	④	⑤
24	Not getting enough time for leisure	①	②	③	④	⑤
25	Getting up early in the morning to go to school	①	②	③	④	⑤
26	Having too much homework	①	②	③	④	⑤
27	Having to study things you don't understand	①	②	③	④	⑤
28	Having to concentrate too long during school hours	①	②	③	④	⑤
29	Compulsory school attendance	①	②	③	④	⑤
30	Not enough money to buy the things you need	①	②	③	④	⑤
31	Satisfaction with how you look	①	②	③	④	⑤
32	Living at home	①	②	③	④	⑤
33	Not enough money to buy the things you want	①	②	③	④	⑤
34	Abiding by pretty rules at school	①	②	③	④	⑤
35	Getting along with your teachers	①	②	③	④	⑤
36	Not being taken seriously by your parents	①	②	③	④	⑤
37	Abiding by petty rules at home	①	②	③	④	⑤
38	Disagreements between you and your father	①	②	③	④	⑤
39	Disagreements between you and your teachers	①	②	③	④	⑤
40	Having to take on new familial responsibilities with growing older	①	②	③	④	⑤
41	Disagreements between you and your brothers and sisters	①	②	③	④	⑤
42	Being hassled for not fitting in	①	②	③	④	⑤

12A. When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

- ① Not at all true for me ② Partially not true for me ③ Partially true for me
④ Very true for me

1	I try to figure out what I did wrong so that it won't happen again.	①	②	③	④
2	I try to see what I did wrong.	①	②	③	④
3	I think about some way to keep this from happening again.	①	②	③	④
4	I try to figure out how to do better next time.	①	②	③	④
5	I think of some things that will help me next time.	①	②	③	④

12B. When I have trouble with a subject in school,

- ① Not at all true for me ② Partially not true for me ③ Partially true for me ④ Very true for me

6	I ask for some help with understanding the material.	①	②	③	④
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7	I get some help to understand the material better.	①	②	③	④
8	I ask the teacher to go over it with me.	①	②	③	④
9	I ask the teacher to explain what I didn't understand.	①	②	③	④
10	I get some help on the parts I didn't understand.	①	②	③	④

12C. When something bad happens to me in school (like not doing well on a test or not being able to answer an important question),

- ①Not at all true for me ②Partially not true for me ③Partially true for me
④Very true for me

11	I talk about it with someone who will make me feel better.	①	②	③	④
12	I spend time with someone who will cheer me up.	①	②	③	④
13	I talk about it with someone I'm close to.	①	②	③	④
14	I discuss it with someone who will help me feel better about it.	①	②	③	④
15	I talk with someone who will keep me from feeling bad about it.	①	②	③	④

12D. When I run into a problem on an important test,

- ①Not at all true for me ②Partially not true for me ③Partially true for me
④Very true for me

16	I think about the times I did it right.	①	②	③	④
17	I tell myself it's not so bad to make a mistake.	①	②	③	④
18	I tell myself I'll do better next time.	①	②	③	④
19	I tell myself I'll have another chance.	①	②	③	④
20	I tell myself it'll be okay.	①	②	③	④

12E. When I have difficulty learning something,

- ①Not at all true for me ②Partially not true for me ③Partially true for me
④Very true for me

21	I think about all the reasons it's important to me.	①	②	③	④
22	I remind myself that it's worth it to me in the long run.	①	②	③	④
23	I remind myself that this is important in reaching my own goals.	①	②	③	④
24	I remind myself that it's something that I really want to do.	①	②	③	④
25	I think about how this is important for my own personal goals.	①	②	③	④

Appendix C: Table 1. Means, standard deviations, and correlation matrix among variables.

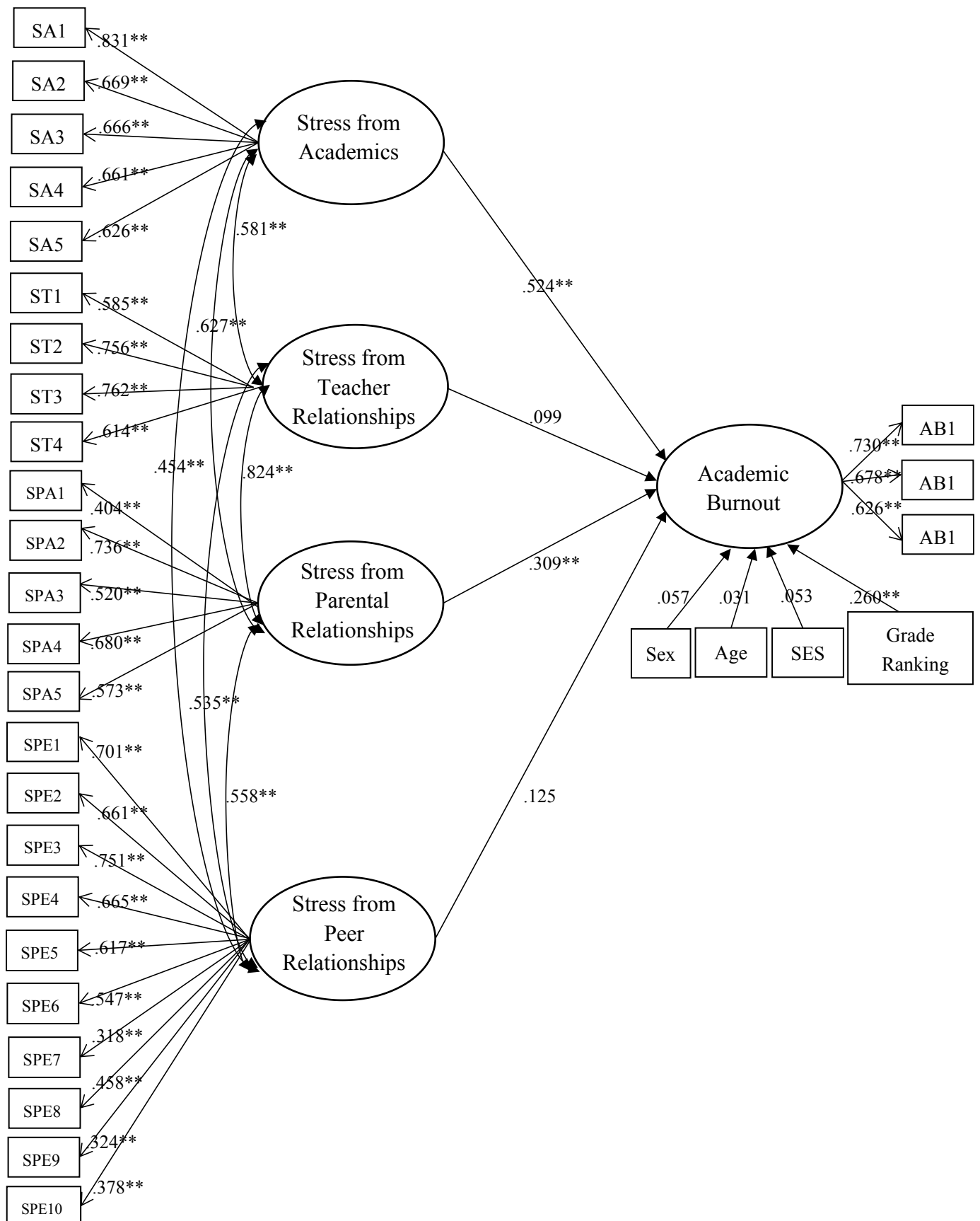
Variables	M	SD	1	2	3	4	5	6	7	8	9
(1) Stress from Academics	2.319	0.672	1								
(2) Stress from Teacher Relationship	1.843	0.783	0.371**	1							
(3) Stress from Parental Relationship	1.653	0.826	0.573**	0.544**	1						
(4) Stress from Peer Relationship	1.649	0.532	0.487**	0.403**	0.489**	1					
(5) Academic Burnout	2.271	0.789	0.658**	0.523**	0.679**	0.402**	1				
(6) Adaptive Academic Coping	2.755	0.524	-0.411**	-0.364**	-0.359**	-0.308**	-0.643**	1			
(7) Sex	1.517	0.250	0.036**	0.058**	0.067**	0.095**	0.072**	-0.076**	1		
(8) Age	14.59	0.241	-0.098	-0.073	-0.084**	-0.107**	-0.138**	0.067	0.073**	1	
(9) Socio-economic Status	2.385	1.635	-0.095	-0.062	-0.121	-0.073	0.085	0.027	-0.842	0.046	1
(10) Exam Ranking	2.54	1.403	0.049**	0.142**	0.162**	0.137**	0.279**	-0.238**	0.042**	0.096	0.132**

N=518; Male=1, Female=2, * $p < .05$, *** $p < .001$.

Appendix D: Table 2. Means and standard deviations between male and female.

Variables	Male		Female	
	M	SD	M	SD
Stress from Academics	2.263	0.668	2.471	0.674
Stress from Teacher Relationship	1.397	0.947	2.249	0.638
Stress from Parental Relationship	1.605	0.802	1.686	0.831
Stress from Peer Relationship	1.642	0.531	1.649	0.532
Academic Burnout	2.189	0.769	2.304	0.746
Adaptive Academic Coping	2.899	0.547	2.538	0.549
Age	14.53	0.238	14.59	0.242
Socio-economic Status	2.406	1.647	2.375	1.635
Exam Ranking	2.33	1.401	2.87	1.403

Appendix E: Figure 2. Model of the relationship between stress from academics, stress from teacher relationships, stress from parental relationships, stress from peer relationships and academic burnout.



Appendix F: Table 3. Impact of Stress from Academics and Academic Burnout

Dependent Variable	Independent Variable	Product of coefficients			
		β	SE	t	<i>p</i>
Academic Burnout	Stress from Academics (SA)	0.563***	0.033	17.201	0.000
	Adaptive Academic Coping (AAC)	-0.474***	0.032	-14.644	0.000
	SA \times AAC	-0.063*	0.026	-1.917	0.039
	Sex	0.008	0.023	0.367	0.713
	Age	0.005	0.002	0.580	0.624
	SES	-0.015	0.022	-0.682	0.495
	Exam Ranking	-0.011	0.017	-0.670	0.503

N=518; * $p < .05$, *** $p < .001$.

Appendix G: Figure 3. Interaction between Stress from Academics (SA) and Adaptive Academic Coping (AAC) on Academic Burnout.

