

## CHALLENGE–HINDRANCE STRESS AND ACADEMIC ACHIEVEMENT: PROACTIVE PERSONALITY AS MODERATOR

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We examined the influence of challenge stress and hindrance stress on the academic achievement of college students and whether or not the effect of the type of stress was moderated by proactive personality. Data were collected from 246 students at 4 universities in southern China through a 2-phase longitudinal survey. The results indicated that challenge stress was positively related to academic achievement and hindrance stress was negatively related to academic achievement. In addition, both these relationships were moderated by proactive personality. Theoretical and practical implications, limitations, and directions for future research are discussed.

*Keywords:* challenge stress, hindrance stress, proactive personality, academic achievement.

Stress is an individual's physiological and emotional state of anxiety or frustration that greatly influences his or her behavior (Cryer, McCraty, & Childre, 2003). Researchers' interest in stress, which began with its negative effect on behavior, has shifted to a more balanced view of both its positive

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and negative effects (Jamal, 2007). However, although educational researchers found that stress was a key antecedent affecting college students' academic achievement, there were inconsistent results in studies of the outcome of the relationship between stress and achievement (LePine, LePine, & Jackson, 2004). Yerkes and Dodson (1908) found an inverted U-shaped relationship between stress and performance, indicating that only moderate levels of stress improved performance and either excessively high or excessively low levels of stress reduced the quality of performance. In addition to focusing on stressors and stress and the direct relationship between stress and performance, researchers began to examine individual and environmental factors that moderate the stress–performance relationship (Podsakoff, LePine, & LePine, 2007). Researchers have used personality variables such as the Big Five factors (Hengartner, van der Linden, Bohleber, & von Wyl, 2016), Type A behavior (Jamal, 2013), locus of control (Conley & You, 2014), and core self-evaluation (Yuan, Li, & Lin, 2014) as moderators of the relationship between stress and performance.

We followed this line of research and examined the impact of a new personality variable, proactive personality, on the stress–performance relationship. Over the past few decades, the business world has often seen the fall and comeback of successful entrepreneurs, such as Steve Jobs, who was fired from his own company by the board in the mid 1980s, or the controversial billionaire and President of the United States, Donald Trump, who was bankrupted in the early 1990s. They faced extremely stressful situations in their career but managed to come back because, among other things, they took the initiative to change their environment in their favor rather than to react passively to the stress. This personality trait is proactive personality (Fuller & Marler, 2009).

We were especially interested in finding how the two types of stress, namely, challenge and hindrance, influenced the academic achievement of college students (business and other majors) and how the students' proactive personality moderated the stress–performance relationship. Participants in this study were college students in Canton, one of the most commercialized regions in southern China. China has the world's second largest economy with a high economic growth rate over the past three decades. Chinese college students face more fierce competition and higher stress in their study and job search than do their counterparts in Western countries, given China's huge annual college graduate population (7.49 million in 2015) and shrinking job market in recent years (Chou, Chao, Yang, Yeh, & Lee, 2011). Students' proactive personality may influence how they make sense of, and cope with, stress in their study and career. Our findings may shed some light on how faculty members in higher education institutions can help students with their learning and job search. Our findings may also be useful for recruiters and managers in their selection of recent college graduates who best fit their job requirements in terms of coping with stress.

## Literature Review and Hypotheses Development

### Challenge–Hindrance Stress and Academic Achievement

According to Lazarus and Folkman (1984), *stress* is a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her capacity or resources. Study results showing the outcomes of the influence of stress on college students' academic achievement are inconsistent (LePine et al., 2004). Some researchers have found that stress negatively impacts on students' academic achievement (Albeg & Castro-Olivo, 2014; Goldstein, Boxer, & Rudolph, 2015), and others that stress positively influences academic achievement (Kumari & Gartia, 2012). In contrast, Rafidah et al. (2009) found that learning stress was not related to students' academic achievement.

To address these contradictions, Cavanaugh, Boswell, Roehling, and Boudreau (2000) proposed that it may be the type, rather than the level, of stress that leads to positive or negative outcomes. They introduced the two types of stress: challenge and hindrance. *Challenge stress* refers to work stress that benefits individual career development, including work overload, time pressure, and job duties and responsibilities. In contrast, *hindrance stress* denotes work stress that obstructs individual career development, including role ambiguity, organizational politics, and job insecurity (Edwards, Franco-Watkins, Cullen, Howell, & Acuff, 2014; Zhang & Lu, 2009.). The factors that create challenge stress are a closer match than are those of hindrance stress to the motivators in the two-factor theory of motivation. According to this theory, intrinsic factors in a job, such as job responsibility and achievement, can push people to work very hard (Herzberg, 2003). Thus, it can be expected that learning, as the students' "job", and achievement, when they receive their desired grades, will motivate students to make more effort to overcome learning difficulties thus enhancing their academic achievement. In contrast, the hindrance stressors, such as classroom environment (crowded and noisy) or peer pressure, are a closer match to the extrinsic factors (such as work conditions and company policies) in Herzberg's (2003) two-factor theory. These factors may demotivate students in their learning, leaving them feeling frustrated and afraid of learning difficulties. The factors may eventually lead to lower student academic achievement. Therefore, we proposed the following hypotheses:

**Hypothesis 1:** Challenge stress will have a significantly positive impact on academic achievement.

**Hypothesis 2:** Hindrance stress will have a significantly negative impact on academic achievement.

### Proactive Personality and Academic Achievement

Individuals with a *proactive personality* have a stable tendency to interact

with their environment (Bateman & Crant, 1993). Proactive personality is a very useful predictor for individual behavior because it is not easily affected by environmental factors (Fuller & Marler, 2009). Proactive individuals tend to shape or change their surroundings intentionally and to develop their resources actively. Thus, individuals with a highly proactive personality are more likely to succeed than are those with a less proactive personality. Proactive students actively seek opportunities to help their learning and they enjoy improving their ability to realize their goals (Li, Liang, & Crant, 2010). As proactive students are supported more by their teachers, they are likely to have higher achievement (McNall & Michel, 2011). Therefore, students with a proactive personality can be expected to take the initiative to improve themselves, proactively enrich their learning environment, and reach higher academic achievement. Thus, we proposed the following hypothesis:

**Hypothesis 3:** Proactive personality will have a significantly positive impact on academic achievement.

### **The Moderating Role of Proactive Personality**

In response to the call of Podsakoff et al. (2007) to examine individual differences in challenge–hindrance stress, we included proactive personality in our study design and tested its moderating effect on the relationship between stress and academic achievement.

Stress is a psychological response brought about by person–environment interaction. Drawing on Mischel's (1977) situational strength theory, stress can be considered in terms of situational strength, namely, high challenge or high hindrance stress is a strong situation and low challenge or low hindrance stress is a weak situation. In a lower challenge or lower hindrance stress situation, individuals with a proactive personality tend to have a greater sense of self-efficacy, experience more positive emotions, show initiative, take action, and maximize their learning ability to achieve higher academic achievement. In contrast, individuals whose personality is less proactive are negative and passive; as they are accustomed to adapting to the environment and being forced to change, which leads to lower confidence, less learning efficiency, and lower academic achievement.

However, individuals behave differently in a higher challenge stress situation and higher hindrance stress situation. They should take action to improve their current inner or outer circumstances, actively seek solutions to academic problems to meet academic requirements, and have higher academic achievement in a higher challenge stress situation, regardless of their level of proactive personality. In contrast, when individuals face a higher hindrance stress situation that is potentially negative and stable, their learning motivation and effort decreases, and they tend to withdraw from the situation that hinders their growth and

development (LePine et al., 2004). Therefore, the impact of challenge stress and hindrance stress on academic achievement can be expected to be contingent on the level of the students' proactive personality. Thus, we proposed the following hypothesis:

**Hypothesis 4:** The relationship between challenge–hindrance stress and academic achievement will be negatively moderated by proactive personality, such that more proactive individuals will report higher academic achievement in lower challenge and lower hindrance stress situations, and all individuals will report higher academic achievement in higher challenge stress situations but lower academic achievement in higher hindrance stress situations, regardless of the level of their proactive personality.

## Method

### Participants and Procedure

Participants were college students at four universities in Canton, southern China, who took management classes with two of the three coauthors of this study. The students were made aware that their participation was voluntary and informed of their rights, namely, the no-known-risk nature of the research, and that there was no impact on their course grade, whether or not they chose to participate. A two-phase longitudinal survey was conducted over a 20-week semester: Phase I, a survey of challenge–hindrance stress and proactive personality, was held at the beginning of the semester, and Phase II, a survey about the academic achievement of the same group of students, was held at the end of the semester. Of the 312 copies of the survey that were distributed, 246 responses were valid, for a response rate of 78.85%. Of the 246 respondents, 55.7% were women, 44.3% were men; 39% were aged from 17 to 20 years, and 61.0% were aged from 21 to 25 years; 43.1% were student cadres with extra-curricular, administrative roles, while 56.9% did not have such roles, and 55.3% were business majors, and 44.7% were diverse majors including engineering, sciences, and liberal arts.

### Measures

**Challenge–hindrance stress.** We used the 10-item, 5-point Likert rating stressor scale developed by LePine et al. (2004) and adapted for use in the Chinese context by Lee (2009), to measure hindrance–challenge stress. Responses ranged from 1 (*no stress*) to 5 (*high level of stress*). Sample items are “The difficulty of the work required in your classes” (challenge stress) and “The degree to which your learning progression seems stalled” (hindrance stress). Confirmatory factor analysis (CFA) results for the data fit for the two-factor model were:  $\chi^2/df = 1.238$ , goodness-of-fit index (GFI) = .975, comparative fit index (CFI) =

.992, root mean square residual (RMR) = .042, and root mean square error of approximation (RMSEA) = .031.

**Proactive personality.** We used Bateman and Crant's (1993) 17-item, 5-point Proactive Personality Scale to measure proactive personality. Responses ranged from 1 (*completely disagree*) to 5 (*completely agree*). A sample item is "I excel at identifying opportunities." CFA results were:  $\chi^2/df = 1.218$ , GFI = .957, CFI = .990, RMR = .032, RMSEA = .03.

**Academic achievement.** We used the 14-item, 7-point Likert rating scale developed by Zhou, Sang, and Ge (2010) and adapted for use in the Chinese context by Wang, Li, and Huang (2011) to measure three dimensions of academic achievement, namely, learning performance, interpersonal facilitation, and learning dedication. Sample items are "The efficiency of my learning" (learning performance), "The extent of my cooperation with other students" (interpersonal facilitation), and "The extent of my effort at learning" (learning dedication). Responses ranged from 1 (*far below average*) to 7 (*far above average*). CFA results were:  $\chi^2/df = 1.521$ , GFI = .951, CFI = .981, RMR = .039, RMSEA = .046.

**Control variables.** Gender, student cadre, age, and majors were included as control variables because previous researchers have found that some of these may be related to the independent and dependent variables in this study (e.g., Boswell, Olson-Buchanan, & LePine, 2004; Wang & Huang, 2011; Zhang & Lu, 2009). Gender (male or female) and student cadre (student cadre or nonstudent cadre) were binary variables. Age was divided into two groups (20 years or below and 21 years or above), and majors into four categories: business, engineering, science, and liberal arts.

**Reliability and validity.** As shown in Table 2, Cronbach's  $\alpha$  for each variable ranged from .716 to .908, indicating that the measures have high reliability. The scales that we used are well established and widely used. The CFA results showed that all the measures reached an acceptable level of fit. Also, as shown in Table 1, the four-factor model was most suitable, indicating that common method variance in this study was well controlled.

## Data Analysis

Correlation analysis was used to examine the preliminary relationships between the independent variables, dependent variable, and control variables. Multistep, hierarchical linear regression analyses were conducted to test the hypotheses. All statistical analyses were performed using SPSS 18.0.

Table 1. Results of Confirmatory Factor Analysis

Model	$\chi^2$	df	$\chi^2/df$	RMSEA	CFI	TLI	RMR	IFI	PGFI	PNFI
Four factor	1148.434	749	1.533	.047	.913	.900	.063	.915	.794	.687
Three factor	1251.539	760	1.647	.051	.893	.879	.070	.895	.788	.680
One factor	2067.327	768	2.692	.083	.717	.683	.120	.723	.640	.554

Note. *N* = 246. Four-factor model = proactive personality, challenge stress, hindrance stress, and academic achievement; three-factor model = proactive personality, challenge stress + hindrance stress, and academic achievement; one-factor model = proactive personality + challenge stress + hindrance stress + academic achievement; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; RMR = root mean square residual; IFI = incremental fit index; PGFI = parsimonious goodness-of-fit index; PNFI = parsimonious normed fit index.

### Results

Descriptive statistics and correlations among the variables are presented in Table 2. Variance inflation factors (VIFs) were also calculated and all VIF values were within the acceptable range of 1 to 4 (Pan & Jackson, 2008).

Table 2. Descriptive Statistics and Correlation Analysis Among Study Variables

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Gender	1.56	0.50	–							
2. Age	1.64	0.51	-.032	–						
3. Major	2.81	1.37	.516***	-.028	–					
4. Student cadre	0.43	0.50	.082	-.081	.080	–				
5. Challenge learning stress	2.94	0.73	-.145*	-.049	-.276***	-.139*	.716			
6. Hindrance learning stress	2.90	0.76	-.124+	-.130*	-.142*	-.107+	.631***	.764		
7. Proactive personality	3.62	0.56	-.115+	-.048	-.136*	.111+	.200**	.098	.898	
8. Academic achievement	4.44	0.63	.083	-.044	.126*	.172**	.128*	-.137*	.203**	.908

Note. *N* = 246. Reliability coefficients are shown in parentheses on the diagonal.

\*\*\* *p* < .001, \*\* *p* < .01, \* *p* < .05.

Table 3. Results of Regression Analysis with Interaction Effect of Proactive Personality on Challenge–Hindrance Stress and Academic Achievement

Variables	Academic achievement					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	4.241	4.031	3.338	3.396	3.662	3.635
Gender	.015	-.011	.029	.001	.008	.012
Age	-.028	-.053	-.019	-.047	-.035	-.038
Major	.105	.182*	.128+	.192**	.175*	.173*
Student cadre	.164*	.175*	.135*	.151*	.138*	.138*
CS		.434***		.397***	.371***	.353***
HS		-.375***		-.367***	-.397***	-.379***

Table 3 continued

Variables	Academic achievement					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PP			.208**	.167**	.137*	.143*
PP × CS					-.190**	
PP × HS						-.216***
Adjusted $R^2$	.027	.140	.066	.163	.193	.204
$\Delta R^2$	–	.118	.041	.026	.032	.043
$\Delta F$	–	16.821***	10.857**	7.545**	9.706**	13.153***
$F$	2.724*	7.662***	4.440**	7.825***	8.310***	8.840***

Note.  $N = 246$ . CS = challenge stress; HS = hindrance stress; PP = proactive personality.

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

The results of multiple hierarchical linear regression analyses are shown in Table 3. As shown in Model 1, the influence of all control variables on academic achievement was tested. Also, Student-Newman-Keuls and Tukey tests showed no significant differences in academic achievement in terms of gender and age, although the academic achievement of engineering majors was significantly higher than that of the business majors, and that of the student cadres was significantly higher than that of the noncadres. As shown in Model 2, when all demographic variables were controlled, academic achievement was significantly and positively related to challenge stress ( $\beta = .434, p < .001$ ) and negatively related to hindrance stress ( $\beta = -.375, p < .001$ ). These results showed that academic achievement increased when challenge stress increased but decreased when hindrance stress increased. Therefore, Hypotheses 1 and 2 were both supported. As shown in Model 3, when all demographic variables were controlled, academic achievement was significantly and positively related to proactive personality ( $\beta = .208, p < .001$ ). This result indicated that academic achievement increased when proactive personality was high. Thus, Hypothesis 3 was also supported.

As shown in Model 4, all the independent variables and the moderating variable were entered. The interaction effect of proactive personality and challenge–hindrance stress on academic achievement was tested in Models 5 and 6 after mean-centering all variables (Aiken & West, 1991). In Model 5, the interaction effect of challenge stress and proactive personality on academic achievement was negatively significant ( $\beta = -.190, p < .01$ ), and explained an additional 3.2% of the variance in academic achievement. In Model 6, the interaction effect of proactive personality and hindrance stress on academic achievement was also negatively significant ( $\beta = -.216, p < .001$ ), and explained an additional 4.3% of the variance in academic achievement. Therefore, Hypothesis 4 was supported. The results showed that proactive personality moderated the relationship between challenge–hindrance stress and academic achievement.

## Discussion

Since Cavanaugh et al. (2000) introduced the challenge–hindrance stress framework, many researchers have examined the relationship between the two types of stress and performance. However, to the best of our knowledge, we are one of the first to examine the impact of challenge–hindrance stress on academic achievement.

Our results show that challenge stress and hindrance stress had significant but different effects on academic achievement. Challenge stress improved students' academic achievement and hindrance learning stress had an adverse effect. This finding supports the theoretical perspective of challenge–hindrance stress (Cavanaugh et al., 2000; LePine et al., 2004). Also, an important result in this study is that students with a higher level of proactive personality reported higher academic achievement in a lower challenge stress or hindrance stress situation. However, most students reported higher academic achievement in a higher challenge stress situation and lower academic achievement in a higher hindrance stress situation, regardless of their proactive personality status. Thus, these results support the situational strength theory (Mischel, 1977). Our primary theoretical contribution in this study was that proactive personality played a moderating role in the relationship between challenge–hindrance stress and academic achievement.

Our findings also provide insights for practitioners of higher education and business. College students in China, especially business majors, experience higher challenge and hindrance stress because of higher academic requirements, stronger peer competition, and a tougher job market than ever before. They need the educators (faculty and relevant staff) to help them cope with stressful situations in college, improve their academic achievement, and help their future career success. Keeping a moderately high level of challenge stress and reducing hindrance stress are helpful strategies for college students to have high academic achievement. Faculty and other staff can help students by having, for example, clearer learning requirements, more interaction with them, more campus activities choices, and better campus services, such as a cafeteria.

Another critical finding in this study is that students with high proactive personality completed tasks more quickly and received better grades than did those with low proactive personality. Thus, universities can take measures to help develop the proactive characteristics of students, whose personality development is not yet complete, owing to their age. Staff can provide more focused counseling services and organize more seminars or training programs on proactive behavior, especially for the less proactive students. Faculty members can encourage less proactive students to participate more in class activities, take the initiative in after-class learning, and ask instructors for advice more often. Our finding of the challenge–hindrance stress–proactive personality interaction

effect on academic achievement indicates that faculty and other staff should take action to help relieve students' challenge-hindrance stress and improve their proactive characteristics.

There are several limitations to this study. Firstly, although we used a two-phase survey and common method variance was well controlled, data were all collected from a single source, namely, the participants' self-reports. Future researchers should obtain data from different sources to further reduce common method variance, for example, by not only collecting challenge-hindrance stress data from students, but also academic achievement data from a more objective source, such as the university registrar's grade point average (GPA) record (with the students' consent), or their academic advisors' evaluation. We attempted to use GPA previously but found that the response rate to the item on GPA was too low to use, and many students reported afterwards that they did not know their GPA number. Secondly, the data collection site is a limitation. That the survey was conducted among college students in one city in southern China may have affected the external validity and generalizability of our findings. Future researchers should consider collecting data in different regions of China and even in other countries, taking into account cross-cultural factors. Finally, we tested the moderating effect of proactive personality only. Further, researchers can examine other different moderating variables, such as the participants' cultural background.

In relation to the individual and environmental factors that moderate the stress-performance relationship, we found that the positive or negative relationships between stress type and academic achievement were moderated by proactive personality. Our findings have contributed both to the literature and management practices in terms of understanding and coping with stress in higher education, especially business. They also lay a good foundation for future researchers on the development of the relationship between challenge-hindrance stress and performance, and the moderating effects of individual and environmental factors on this relationship.

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