

Acculturative Stress, Chinese Proactive Coping, Future Time Perspective, and Subjective Well-Being among Chinese International Students in the U.S.: A Moderation Model

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This article was not written with the assistance of any Artificial Intelligence (AI) technology, including ChatGPT or other support technologies.

Abstract

Chinese international students on U.S. college campuses often experience acculturative stress, a phenomenon concerned with adapting to a new culture. However, there is a paucity of research about how these students use culturally relevant strategies to cope with this stress and enhance their well-being. Based on Heppner et al.'s (2014) cultural and contextual model of coping, this study explores a three-way interaction between Chinese international students' acculturative stress, proactive coping, and future time perspective in predicting their subjective well-being. Participants (N = 198) were undergraduate, graduate, and other status students (in Optional Practical Training) attending U.S. colleges and universities who completed an online survey. Hierarchical multiple regression was used to investigate the moderation model. Results indicated acculturative stress and subjective well-being were negatively correlated. Despite no moderation effects, proactive coping, future time perspective, and perceived English proficiency were associated with subjective well-being. Limitations, future research directions, and implications for clinical practice are discussed.

Keywords: acculturative stress, Chinese international students, proactive coping, subjective well-being, time perspective

Introduction

China has become the largest and fastest-growing contributor of international students to the U.S. Chinese international students encounter mental health challenges, such as acculturation--the process of cultural, psychological, and social adaptation to the host culture (Berry, 2003; Ward, 2020). Li et al. (2017) suggested that Chinese international students

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had difficulties in acculturating into the American culture in many areas, including language, social interactions, learning, living and working in the U.S., and psychological adjustment. These difficulties can lead to acculturative stress, a debilitating response to the challenges of intercultural living (Berry, 1970). Mounting studies about this problem among international students are found in the literature (e.g., Franco et al., 2019; Ge & Durst, 2022; Le, 2022; Ma et al., 2020; Ra & Trusty, 2015).

Although there has been an increasing interest in studying acculturative stress among international students, much of the literature focuses on its negative outcomes, such as anxiety, depression, social isolation, and suicidal ideation (Hamamura & Laird, 2014; Huang & Mussap, 2018; Gebregergis et al., 2019; Rice et al., 2012; Wang & Mallinckrodt, 2006). The overemphasis on weaknesses of acculturative stress creates a stereotype that portrays international students as problematic or deficient (Yoon & Portman, 2004) and contradicts the argument that individuals can deal effectively with stressors and achieve positive outcomes (Berry, 2006). Nevertheless, positive outcome variables have been infrequently studied in acculturation research (Yoon et al., 2008). Subjective well-being and adaptive coping are two areas that extend the research beyond pathology.

First, subjective well-being (SWB) describes how people evaluate the quality of their lives, including cognitive judgments about life satisfaction and affective reactions such as joy and sadness to life events (Diener, 2021). Individuals with higher SWB experience lower levels of negative affect, higher levels of positive affect, and higher life satisfaction (Diener, 2009). Life changes affect subjective well-being in both the short and long term (Hansson et al., 2008; Hu et al., 2020). Yoon et al. (2013) reported that acculturation was associated with life satisfaction and positive affect among international students and associated with SWB among Korean immigrants.

Second, coping has been identified as influential in the acculturation process of international students (Berry, 1997, 2006) and integral to managing acculturative stress among Asian international students (Ra & Trusty, 2015; Wei et al., 2012). Berry (1997, 2006) conceptualized coping strategies as a moderating factor between acculturative stress and psychological adaptations. However, much of the coping research focuses on reactive coping strategies that occur after stressful events. Tian and Heppner (2018) proposed that such a focus offers a limited understanding of the range of coping strategies. One neglected line of research is proactive coping, defined as “efforts undertaken in advance of a potentially stressful event to prevent it or to modify its form before it occurs” (Aspinwall & Taylor, 1997, p. 417). Proactive coping offers several advantages, including minimizing the impact of stressful events, acquiring coping resources to prepare for potential stressors, expanding stress management options in advance, and reducing the burden of chronic stress. Tian and Heppner (2018) developed the Chinese Proactive Coping (CPC) Inventory and highlighted the need to study the relationship between CPC and personality variables. One such variable, time perspective (TP) is “the often unconscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (Zimbardo & Boyd, 2015, p. 1271). A future time perspective (FTP) is characterized by efforts to plan for goal attainment beyond the present. Several studies have found that FTP can help individuals develop preventive health behaviors and build life satisfaction (Chen et al., 2017; Dwivedi & Rastogi, 2017). However, there is a dearth of research investigating the relationship between FTP and psychological outcomes among Chinese international students. Therefore, this study examined the moderation of proactive coping and FTP on SWB and acculturative stress among Chinese international students in the U.S.

Literature Review

Acculturative Stress and Coping among Chinese International Students

Yeh and Inose (2003) suggest that Chinese international students appear to experience a high level of difficulties acculturating to the United States due to the significant differences in cultural and social norms between the U.S. and China. One of the most significant and challenging issues is language barriers (Mori, 2000), which can significantly hinder Chinese international students’ academic performance and cross-cultural adaptation. Additionally, the significant cultural differences between Chinese and U.S. cultures contribute to acculturative stress, leading to conflicts in values and experiences of two cultures (Chen et al., 2015). For example, Chinese international students, hailing from a collectivistic culture that places a significant emphasis on interdependence and strong bonds, may find themselves puzzled when engaging with American students who prioritize individualistic qualities, like independence, assertiveness, and self-reliance. Differences in educational norms further compound the issue, as the Chinese system emphasizes teacher-centered, information-focused, and test-driven approaches of teaching, while U.S. education is known for its interactive and open-

ended approach (Heng, 2018). Consequently, many Chinese international students feel uncomfortable with various components of the U.S. college education, such as independent library research, group discussions, and frequent presentations, essays, or quizzes (Mori, 2000). Perceived discrimination and ethnical stereotypes against Asian international students add their stress in acculturation to the U.S. college education (Zhang & Jung, 2017).

International students are potentially able to develop coping strategies to address acculturative stress. Numerous studies have explored the impact of coping on acculturative stress among international students (Kim et al., 2012; Lee & Padilla, 2014; Ra & Trusty, 2015). For instance, Ra and Trusty (2015) found that emotion-oriented coping reduces acculturative stress in Asian international students in the U.S. However, only a few researchers (e.g., Wei et al., 2012) have investigated the role of culturally relevant coping strategies in dealing with acculturative stress among Chinese international students. Therefore, this study will investigate a culturally congruent coping strategy (i.e., Chinese Proactive Coping, drawing upon Heppner et al.'s (2014) cultural and contextual model of coping.

Cultural and Contextual Model of Coping

In response to the call for more culturally inclusive research to expand coping models, Heppner et al. (2014) proposed the contextual and cultural model of coping (CCMC). The CCMC is an individual X environmental ecological model for U.S. racial and ethnic minorities. The model accounts for the interaction of individual and environmental factors in five domains, as shown in Table 1.

Table 1

Five domains of CCMC (Heppner et al., 2014)

Domain A	individual factors (e.g., personality traits)
Domain B	three levels of environmental factors (immediate relationships, working and living environment, and macro social-cultural context)
Domain C	e.g., acculturative stress)
Domain D	coping (e.g., coping strategies)
Domain E	health outcomes (e.g., well-being).

In the model, coping is characterized as a complex process that includes the perceptions of stressors, problem appraisal and coping goals, coping strategies, and the function of coping. The model also elaborates on four aspects of coping particularly relevant to racial and ethnic minorities. One such aspect is culturally congruent coping, defined as the appropriate “dealing with particular stressful situations within a particular cultural context” (Heppner et al, 2014, p. 92). For instance, forbearance coping, which usually encourages self-sacrifice, endurance of distress, and social harmony, is culturally congruent with the collectivistic cultural context (Wei et al., 2012).

Given the bidirectionality among the domains in the CCMC, Heppner et al. (2014) posited several hypotheses among the five domains. One hypothesis is that coping (Domain D: e.g., culturally congruent coping) may moderate the relationship between stress factors (Domain C: e.g., acculturative stress) and outcomes (Domain E: e.g., subjective well-being). The moderating effect of culturally congruent coping has been demonstrated in research (e.g., Hernández & Villodas, 2019; Wei et al., 2008; Wei et al., 2010). Wei et al. (2010) found the relationship between racial discrimination stress (Domain C) and depressive symptoms (Domain E) was moderated by collectivistic coping (Domain D) among Asian Americans. However, much of this body of research has focused on reactive coping, which Tian and Heppner (2018) argued provides only a partial understanding of this coping. Kim et al. (2005) asserted that reactive coping is not congruent with Asian values like emotional self-control, and Wei et al. (2008) found that the extensive use of reactive coping in response to racial discrimination stress heightened the vulnerability to depressive symptoms among Asian international students.

Chinese Proactive Coping

The benefits of proactive coping include learning from previous mistakes and planning for future goals (Schwarzer & Knoll, 2003). Onyedibe (2019) maintained that proactive coping leads to life improvements, while Hambrick and McCord (2010) noted it fosters the perception of stressors as challenges rather than threats. Other benefits include promoting health, personal growth, and well-being, as well as reducing levels of depression, functional disability, self-blame, and burn-out (Greenglass

& Fiksenbaum, 2009; Greenglass et al., 2005; Greenglass et al., 1999; Rogalla, 2020; Schwarzer & Knoll, 2003; Schwarzer & Taubert, 2002).

Despite the enumerated benefits of proactive coping, there is a need to better understand proactive coping within cultural contexts. In response, Tian and Heppner's (Year) development of the CPC Inventory reflects the values of traditional Chinese philosophical systems such as Taoism and Confucianism. For example, Taoism suggests that happiness and misfortune are cyclical over time, advocating for the principles of "Ju An Si Wei" and "Fang Huan Wei Ran", which translate to "think of danger in time of peace" and "make provisions before troubles occur" respectively. These principles encourage Chinese people to take precautionary and preventive actions. Confucianism also values financial frugality, suggesting preparedness for future emergencies or adversities. Richburg (2012) found a much higher household-savings rate among Chinese international students than their American counterparts. This proactive approach suggests that Chinese international students are predicted to cope effectively with acculturative stress and enjoy positive subjective well-being.

Future Time Perspective

Heppner et al. (2014) suggested that individual factors such as cognitive and affective processes are integral to coping with stress. Time perspective (TP) is an unconscious cognitive process that organizes personal and social experiences into temporal categories, "which help to give order, coherence, and meaning to those events" (Zimbardo & Boyd, 2015, p. 1271). TP can be used to encode, store, and recall experienced events, as well as the formation of expectations, goals, contingencies, and imaginative scenarios. TP is a significant psychosocial predictor of individuals' psychological and behavioral outcomes, such as anxiety, depression, physical health, subjective well-being, and happiness (Anagnostopoulos & Griva, 2012; Drake et al., 2008; Guthrie et al., 2009; Sailer et al., 2014). Zimbardo and Boyd (2015) identified five distinct TPs: past-negative (characterized by a pessimistic, negative view of the past, marked by regrets and rumination about past harms), past-positive (a positive evaluation of the past, perceived as bearing the values and experiences associated with happiness), present-hedonistic (an orientation towards present enjoyment and pleasure without sacrificing today for rewards tomorrow), present-fatalistic (characterized by a helpless, hopeless attitude towards the future and life in general) and future (characterized by efforts to plan for achieving future objectives). The future time perspective (FTP) is particularly noted as a robust predictor of many future-oriented behaviors, such as pro-environmental attitudes or behaviors and preventive health behaviors (Chen et al., 2017). Furthermore, FTP has been positively associated with future-oriented coping (i.e., proactive coping) in several empirical studies (Anagnostopoulos & Griva, 2012; Chang et al., 2021; Dwivedi & Rastogi, 2017; Zambianchi & Bitti, 2014).

Theoretical Framework

Heppner et al.'s (2014) CCMC model suggests that individual factors (Domain A: e.g., FTP) and coping (Domain D: e.g., Chinese proactive coping), either independently or in combination, can moderate the relationship between stressors (Domain C: e.g., acculturative stress) and outcomes (Domain E: e.g., subjective well-being). In a recent study, Dwivedi and Rastogi (2017) showed that life satisfaction was positively correlated with proactive coping and FTP. No identified research has explored FTP and culturally congruent proactive coping as moderators between acculturative stress and subjective well-being in an ethnic minority group. This study adopted the CMCC model to explore Chinese proactive coping and FTP as potential moderating mechanisms in the relation between acculturative stress and subjective well-being among Chinese international students.

The proposed hypotheses are as follows: 1. Acculturative stress will be negatively associated with subjective well-being. 2. The negative association between acculturative stress and subjective well-being will be weaker for those with higher levels of Chinese proactive coping compared to their lower levels. 3. The negative association between acculturative stress and subjective well-being will be weaker for those with a higher future time perspective compared to those with a lower one. 4. For Chinese international students with a high (vs. low) future time perspective and those who use more (vs. less) Chinese Proactive Coping strategies, the association between acculturative stress and subjective well-being will be weaker.

Methodology

A cross-sectional survey design was employed to collect data for this study. Hierarchical multiple regression (HMR) analysis was utilized to explore the relationships between acculturative stress, Chinese proactive coping, FTP, and subjective

well-being. A hierarchical regression is appropriate for this study as it allows for the examination of the relationship between these variables, while considering the two-way and three-way interaction effects and demographic control variables.

Participants

Eligible participants met the following inclusion criteria: (a) 18 years of age or older; (b) full-time students currently enrolled in a college or university in the U. S. [including in Curricular Practical Training (CPT) or Optional Practical Training (OPT)]. CPT allows F-1 international students to work related to their field of study during the academic year or summer breaks. OPT allows F-1 international students to work in their field of study for up to 12 months after completing their degree; and (c) self-identified as international students who were originally from mainland China, Hong Kong, Macau, or Taiwan. Of the 266 respondents who took the online survey, 198 (or 74%) completely followed the instructions and completed the survey.

The final sample consisted of 62 males (31.3%), 131 females (66.2%), 1 student who identified as Non-Binary/Genderqueer/Gender Non-Conforming (0.5%), and 4 students who did not indicate their sex (2%). The mean age was 26.3 years ($SD= 4.2$; range= 19–42 years). Most of the participants ($n= 167$, 84.3%) identified as heterosexual or straight; four students identified as gay (2%); six students identified as lesbian (3%); twelve students identified as bisexual (6%); one student (0.5%) identified as other (i.e., queer); and eight students did not indicate their sexuality (4%). Participants were originally from Mainland China ($n= 182$; 92%) and Taiwan ($n=16$; 8%). Forty-three were undergraduate students (21.7%), 56 master's students (28.3%), 93 doctoral students (47%), and 6 students (3%) enrolled as others (i.e., on OPT). Participants were in colleges and universities in 28 states, with the largest number in Texas ($n = 82$, 41.4%).

Procedure

After obtaining approval from our institutional review board, participants were recruited through direct email invitations to complete the Qualtrics online survey. We utilized snowball sampling by sending several email invitations to potential subjects (i.e., student members of Chinese student organizations across different U.S. universities). These participants were then encouraged to send the invitation email to other students they knew who were potential participants. Participants were also recruited through email invitations distributed via our university's email listserv. Participants who completed the survey were eligible to receive a \$5 Amazon gift card.

Measures

The survey was available in both English and Simplified Chinese versions. The Chinese version was taken directly from the scale developers and had been previously validated in the literature. It included demographic items about age, gender, sexual orientation, nationality, relationship status, field of study/major, educational level, and length of time stay in the U. S. A three-item scale was used to measure perceived English language proficiency, for which Wei et al. (2012) reported an internal consistency of .89 among Chinese international students.

The Acculturative Stress Scale for Chinese Students (ASSCS; Bai, 2016) was used to measure participants' acculturative stress. The scale measures the acculturative stressors experienced by Chinese international students in their daily lives in the U.S. The ASSCS consists of 32 self-report items across five dimensions: (a) language insufficiency (10 items), (b) social isolation (8 items), (c) perceived discrimination (7 items), (d) academic pressure (4 items), and (e) guilt towards family (3 items). Higher scores on the scale indicate greater levels of acculturative stress. ASSCS has demonstrated high internal consistency, as evidenced by an overall Cronbach's alpha of 0.939 (Bai, 2016). Furthermore, the scale's criterion-related validity is supported by a negative association with life satisfaction and a positive association with depression among Chinese international students (Bai, 2016).

Given the three factors of subjective well-being—positive affect, absence of negative affect, and life satisfaction (Diener et al., 2003)—subjective well-being was measured by the following two scales. The Positive and Negative Affect Scales (PANAS; Watson et al, 1988) are two 10-item scales used to measure the levels of states of positive affect (PA) and negative affect (NA). The items are rated on a five-point Likert scale, where 1 = (very slightly or not at all) and 5= (extremely). Higher scores indicate stronger positive or negative affect. Du and Wei (2015) confirmed the reliability and validity of PANAS for Chinese international students, with Cronbach's alphas ranging from .86 to .89 for PA scores and .88 for NA scores. Convergent and discriminant validity have been demonstrated through a significant positive correlation between PA and life satisfaction and a significant negative correlation between NA and life satisfaction (Du & Wei, 2015).

The self-evaluation of global life satisfaction was assessed by the Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS consists of 5 items and measures global life satisfaction based on one's cognitive self-evaluation. Participants rated their satisfaction level over their previous week on a 7-point Likert scale, ranging from 1 = (strongly disagree) to 7 = (strongly agree). Higher scores indicate higher levels of satisfaction with life. For example, studies focusing on Chinese international students' life satisfaction has demonstrated the scale's reliability, with Cronbach's alphas ranging from .85 to .93 (Du & Wei, 2015; Wang et al., 2015; Yi, 2018; Zhang et al., 2010). Additionally, validity of the SWLS has been shown among mainland Chinese (Shao, 1993).

The Chinese Proactive Coping (CPC; Tian & Heppner, 2018) was used to measure proactive coping within a Chinese cultural context. The CPC inventory uses a 5-point Likert-type format ranging from 1 (completely unlike me) to 5 (completely like me), and it consists of 17 items within four underlying categories: Active Preparation for Potential Stressors (APPS: 5 items), Utilizing Knowledge of Potential Stressors (UKPS: 4 items), Contextual Consideration of Proactive Actions (CCPA: 4 items), and Approaching Proactive Actions (APA: 4 items). The CPC inventory has been shown to have good concurrent and construct validity. Tian and Heppner (2018) reported that the CPC's concurrent validity correlates with two well-established coping inventories in expected directions (i.e., the Chinese Problem Solving Inventory and the Mooney Problem Check List). Construct validity was shown through the positive associations of the CPC and three factors (i.e., APPS, UKPS, and APA) of the SWLS, as well as negative associations with the General Procrastination Scale—students, Brief Symptom Inventory-18, and State-Trait Anxiety Inventory. Tian and Heppner (2018) also found an internal reliability of 0.81 for sample A (233 Chinese college students) and an internal reliability of 0.76 for sample B (226 Chinese college students). These researchers also reported that the subscales' Cronbach's alpha ranged from 0.64 to 0.77.

Participants' TP was measured with the Zimbardo Time Perspective Inventory (ZTPI) (Zimbardo & Boyd, 2015). In the present study, only one dimension of the inventory was used, future TP (13 items), which evaluates how much individuals resist the temptation for an immediate reward and wait for a big reward later and make plans to achieve relevant future objectives. The ZTPI uses a 5-point Likert-type format ranging from 1 (very uncharacteristic) to 5 (very characteristic). Higher scores reflect a stronger orientation toward FTP. The Cronbach's alpha coefficients of the original version were .77 for FTP (Zimbardo & Boyd, 2015). The reliability and validity of this scale were supported by a study that evaluated the Chinese version of the ZTPI among 303 Chinese university students (Wang et al., 2015). In this study, the test-retest coefficients were .55 for FTP. For the convergent validity, the FTP was negatively correlated with dysfunctional impulsivity, BAS fun-seeking, depression, and trait anxiety. Conversely, positive correlations were found between FTP and time concern, self-esteem, and conscientiousness, further supporting the scale's validity (Wang et al., 2015).

Data Analysis

IBM SPSS Statistics Version 22 for Microsoft Windows was used for all statistical analyses. Descriptive statistical analyses were conducted to yield means and standard deviations for the variables in the study. To ensure the assumptions for HMR (i.e., normality, linearity, homoscedasticity, and absence of multicollinearity) (Cohen et al., 2014), preliminary analyses including assumption checking and data transformations were conducted prior to examining the moderation effects.

Results

Data screening was used to exclude univariate and multivariate outliers. A univariate outlier is identified and removed if its z score is larger than 3.29 or smaller than -3.29 ($p < 0.001$). One case was identified as an outlier because the z Score for Positive Affect was smaller than -3.29. Two cases were identified as outliers because the z scores for Length of stay were larger than 3.29. One case was identified as an outlier because the z Score for Age was larger than 3.29. A Mahalanobis Distance and a follow-up Chi-square test was computed for each case, and cases with a z score value exceeding 3.29 ($p < 0.001$) were excluded as multivariate outliers. According to this criterion, one case was identified as outliers because its probability was below .001. Therefore, there was a reduction in the usable sample size from 198 to 193 participants.

Previous findings (e.g., Wang & Mallinckrodt, 2006; Wei et al., 2012; Ying & Liese, 1990) indicate that some demographic variables, such as English language proficiency, age, and length of time stay in the U.S., may be associated with psychological well-being, these variables were included as covariates in the subsequent analyses. The means, standard deviations, and inter-correlations among all the main study variables were presented in Table 2.

Table 2*Correlations, Means, and Standard Deviations among Main Study Variables*

Variable	1	2	3	4	5	6	7	8	9
1. Age	1								
2. LoS	.39**	1							
3. PEP	.15*	.44**	1						
4. ASSCS	-.08	-.09	-.31**	1					
5. CPC	.06	.05	.09	-.11	1				
6. FTP	.06	.06	.23**	-.12	.43**	1			
7. PA	.09	.021	.37**	-.27**	.37**	.39**	1		
8. NA	-.06	-.052	-.12	.59**	-.12	-.13	-.21**	1	
9. SWLS	.15*	.11	.28**	-.41**	.30**	.22**	.47**	-.48**	1
Mean	26.61	4.06	11.82	95.76	62.91	3.54	35.16	22.33	20.95
SD	3.94	2.84	2.06	31.52	7.30	.50	5.97	7.42	7.01

Note. LoS=Length of stay in the United States; PEP=Perceived English Proficiency; ASSCS=Acculturative Stress; CPC=Chinese Proactive Coping; FTP=Future Time Perspective; PA=Positive Affect; NA=Negative Affect; SWLS=Satisfaction with Life.

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

Preliminary Analyses

Preliminary analyses including assumption checking and necessary data transformations were conducted prior to examining the main analysis. The results indicated the data met the assumption of normality, linearity, and non-multicollinearity. The standard residual score and Cook's Distance score in the Residuals Statistics table were used to examine homoscedasticity.

The minimum and maximum of the standard residual score should be within -3 to 3. The maximum Cook's Distance score should not be above 1. Based on these criteria, three cases were detected as outliers since the standard residual scores were higher than 3. Thus, there was a reduction in sample size for the main analysis from 193 to 190 participants.

Main Analysis

Before conducting the main analysis, predictor and moderator variables (acculturative stress, Chinese proactive coping, and future time perspective) were centered to avoid multicollinearity in testing interactions. In Step 1, the three covariate variables (i.e., perceived English proficiency, length of time in the United States, and age) were entered. In Step 2, one predictor (i.e., acculturative stress) and two moderators (i.e., Chinese proactive coping and future time perspective) were entered to test the main effects. In Step 3, all possible combinations of two-way interactions (acculturative stress \times Chinese proactive coping, acculturative stress \times future time perspective, and Chinese Proactive coping \times future time perspective) were entered. Finally, in Step 4, a three-way interaction (acculturative stress \times Chinese proactive coping \times future time perspective) was entered to test the three-way interaction hypothesis. The results of hierarchical multiple regression analysis were displayed in Tables 3, 4, and 5.

Table 3

Moderation effect of Chinese proactive coping and future time perspective on the association between acculturative stress and positive affect

Variables	b	SE b	β	t	ΔR^2	ΔF
Step 1					.20	15.45***
Age	.23	.11	.16	2.21*		
LoS	-.49	.16	-.24	-3.08**		
PEP	1.33	.21	.47	6.49***		
Step 2					.18	18.25***
ASSCS	-.02	.01	-.15	-2.41*		
CPC	.21	.05	.27	4.21***		
FTP	2.33	.76	.20	3.05***		
Step 3					.00	.18
ASSCS \times CPC	-.00	.00	-.04	-.52		
ASSCS \times FTP	.00	.02	.00	.06		
CPC \times FTP	-.05	.09	-.04	-.58		
Step 4					.01	2.08
ASSCS \times CPC \times FTP	.00	.00	.10	1.44		

Note. N=190

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

In Step 1, age was significant in predicting positive affect ($\beta = .16$, $t(187) = 2.21$, $p < .05$) and satisfaction with life ($\beta = .16$, $t(187) = 2.09$, $p < .05$). Length of stay in the U.S. had a negative effect on positive affect ($\beta = -.24$, $t(187) = -3.08$, $p < .01$). Perceived English proficiency predicted positive affect ($\beta = .47$, $t(187) = 6.49$, $p < .001$) and satisfaction with life ($\beta = .31$, $t(187) = 4.01$, $p < .001$). Step 2 showed the negative effect of acculturative stress on positive affect ($\beta = -.15$, $t(184) = -2.41$, $p < .05$) and satisfaction with life ($\beta = -.35$, $t(184) = -5.40$, $p < .001$), and the positive effect of acculturative stress on negative affect ($\beta = .60$, $t(184) = 9.65$, $p < .001$). The main effects of Chinese proactive coping and positive affect were significant ($\beta = .27$, $t(184) = 4.21$, $p < .001$). Chinese proactive coping also showed significantly positive effects on satisfaction with life ($\beta = .25$, $t(184) = 3.63$, $p < .001$). Future time perspective was significantly associated with positive affect ($\beta = .20$, $t(184) = 3.05$, $p < .001$). In step 3 and step 4, the two-way interactions and the three-way interactions were not significant.

Table 4

Moderation effect of Chinese proactive coping and future time perspective on the association between acculturative stress and negative affect

Variables	b	SE b	β	t	ΔR^2	ΔF
Step 1					.01	.90
Age	-.13	.15	-.07	-.90		
LoS	.11	.23	.04	.50		
PEP	-.38	.29	-.11	-1.33		
Step 2					.34	32.67***
ASSCS	.14	.02	.60	9.65***		
CPC	-.05	.07	-.05	-.70		
FTP	-.69	.99	-.05	-.70		
Step 3					.01	.65
ASSCS \times CPC	.00	.00	.05	.64		
ASSCS \times FTP	-.01	.03	-.02	-.28		
CPC \times FTP	.15	.12	.08	1.26		
Step 4					.00	.98
ASSCS \times CPC \times FTP	-.00	.00	-.07	-.99		

Note. N=190

*p < .05. **p < .01. ***p < .001

Results indicated that the covariates significantly contributed to positive affect and satisfaction with life. Covariates accounted for 20% of the variance in positive affect ($\Delta F(3, 186) = 15.45, p < .001, \Delta R^2 = .20$) and 11% of the variance in satisfaction with life ($\Delta F(3, 186) = 7.58, p < .001, \Delta R^2 = .11$). Adding one predictor (i.e., acculturative stress) and two moderators (i.e., Chinese proactive coping and future time perspective) in Step 2 significantly added an additional 18% of predicted variance in positive affect ($\Delta F(3, 183) = 18.25, p < .001, \Delta R^2 = .18$), an additional 34% of predicted variance in negative affect ($\Delta F(3, 183) = 32.67, p < .001, \Delta R^2 = .34$), and an additional 19% of predicted variance in satisfaction with life ($\Delta F(3, 183) = 16.47, p < .001, \Delta R^2 = .19$). The two-way interactions in Step 3 did not account for additional variance in the outcome variables. Entering the three-way interaction in Step 4 did not contribute additional variance in the subjective well-being either.

Table 5

Moderation effect of Chinese proactive coping and future time perspective on the association between acculturative stress and satisfaction with life

Variables	b	SE b	β	t	ΔR^2	ΔF
Step 1					.11	7.58***
Age	.28	.13	.16	2.09*		
LoS	-.20	.20	-.08	-.96		
PEP	1.05	.26	.31	4.01***		
Step 2					.19	16.47***
ASSCS	-.08	.02	-.35	-5.40***		
CPC	.24	.07	.25	3.63***		
FTP	.04	.98	.00	.04		
Step 3					.02	1.48
ASSCS \times CPC	.00	.00	.08	1.13		
ASSCS \times FTP	.01	.03	.02	.31		
CPC \times FTP	-.13	.12	-.07	-1.09		
Step 4					.01	2.06
ASSCS \times CPC \times FTP	-.01	.00	-.11	-1.44		

Note. N=190

*p < .05. **p < .01. ***p < .001

Discussion

The study results partially supported the hypotheses. First, the study results supported the hypothesis that acculturative stress is negatively associated with subjective well-being. Further regression analysis for subscales of acculturative stress indicated that language insufficiency, social isolation, and academic pressure significantly correlated with all three aspects of subjective well-being. This suggests that low language insufficiency, social isolation, and academic pressure might be the primary explanation for their greater positive effect. Those individuals with low-level stress in these domains are likely to experience more positive emotions, such as enthusiasm, excitement, and joy. Students with sufficient language competency are likely to engage in more social activities, and more social interactions can engender a sense of belonging and happiness. Conversely, perceived discrimination and guilt towards family were found to be related to negative affect (NA) and life satisfaction.

Second, results showed that Chinese proactive coping significantly predicts positive affect (PA) and satisfaction with life among Chinese international students. However, the hypothesis that Chinese proactive coping would be associated with lower levels of NA was not supported. This tendency suggests that the use of Chinese proactive coping may have a stronger influence on positive mental health outcomes than negative mental health outcomes. Along these lines, Tian and

Heppner (2018) found that proactive coping encompassed positive functions, such as acquiring resources and developing future goals and plans. Such functions not only prepare individuals for potential stressors but also help in managing existing stressors, thereby enhancing psychological adjustment and well-being. These findings underscore the importance of understanding and assessing Chinese international students' use of Chinese proactive coping to promote positive emotions and life satisfaction.

Third, the analysis revealed a positive correlation between future time perspective and both positive affect and satisfaction with life. This finding supported the previous literature indicating the positive impact of future time perspective (e.g., Allemand et al., 2012; Coudin & Lima, 2011; Kooij et al., 2018), suggesting that a future time perspective may contribute to positive educational and health outcomes, including higher academic achievement (i.e., GPA), decreased risk behaviors (i.e., substance use), and increased motivation and goal-directed activities (Kooij et al., 2018; Mello & Worrell, 2006; Zimbardo & Boyd, 1999; Keough, et al., 1999). Therefore, future time perspective can be considered a strength in academic settings, consequently improving positive affect and satisfaction with life.

No support was found for the hypothesized moderation of interactions among acculturative stress, proactive coping, and future time perspective in predicting students' subjective well-being. Several interpretations of these findings warrant consideration regarding the finding. First, since the Chinese proactive coping scale was developed exclusively on a sample of Chinese college students within China, the scale's validity for Chinese international students studying in the US may be questionable. Second, the Chinese proactive coping scale measures stressors that are potential general rather than specific (Tian & Heppner, 2018). Therefore, Chinese proactive coping might not be as sensitive in measuring a specific stressor such as perceived discrimination or guilt towards family. Third, people with a future time perspective are likely to have a more optimistic view of the future, which in turn may lead to more goal-oriented activities. However, their optimism may not help Chinese international students regulate contemporary unpleasant emotions in the face of acculturative stress.

Implications and Conclusion

The study has several important practical implications for university faculty, staff, and administrators to work with Chinese international students across U.S. colleges. First, student affairs services can implement outreach programs aimed at promoting social justice and inclusion of Chinese international students. Counseling centers, international student services, and offices of diversity, equity, and inclusion can be at the forefront of these efforts, along with the support from faculty and academic advisors. With the increase of hate crimes in the U.S. targeting people of Asian descent since the pandemic (Gover et al., 2020), Chinese international students may be vulnerable to heightened fear and anxiety. These efforts can ensure these students perceive their campuses as safe and welcoming places. The findings might help mental health professionals identify potential risk and protective factors affecting the well-being of these students and approaching their concerns through a multicultural perspective. For example, clinicians need to be aware of and understand the impact of aspects of acculturative stress (i.e., social isolation and perceived discrimination) on students' well-being.

Second, culturally competent counselors can help students use their coping styles advantageously. They can identify, interpret, and integrate into counseling their salient values and strengths (Ridley et al., 2021). A major outcome of this endeavor is to help counselors work with these students to develop proactive coping strategies that are compatible with their cultural experiences. Brinson and Kottler (1995) early recognized that a diverse counseling center staff could increase the confidence of international students and engage in meaningful problem solving.

Third, proactive coping and other future-oriented coping strategies can be incorporated into international student orientation programs. These strategies might take shape in seminars, workshops, and ongoing student support groups. Jin and Acharya's (2022) cultural tailoring to improve Asian international students' mental health and adjustment illustrates the possibility of programming with such strategies. As students learn effective proactive strategies to cope with future stressors, they may feel an increased sense of confidence and self-control in the new environment.

Limitations and Future Research Directions

This study's cross-sectional design indicates that no causal inferences between the variables would be derived. A longitudinal design is therefore needed to explore causality and replicate the present findings or examine the causal relationships between variables. Second, social desirability bias may exist due to the use of self-reported questionnaires as a method to collect data. Future research might implement a social desirability scale or combine self-reported data with observer reports and behavioral measures to reduce social desirability. Third, the use of convenience sampling to recruit participants may lead to sampling bias and lack of representation of the population. It may be beneficial for future research

to use random sampling and include more methods of data collection. Fourth, the use of quantitative research design limits the deeper understanding of the underlying mechanisms of the correlations between variables. As such, it would be helpful to include interviews, open-ended questions, and other qualitative methods to gather more in-depth information to interpret the quantitative findings from the present study. Lastly, study results did not provide support for the hypothesized moderation effects. Clearly, more research is needed to investigate the role of Chinese proactive coping and future time perspective on various stressors in this population. Despite these limitations, the current study provides the preliminary groundwork for this relatively unexamined area of Chinese proactive coping research.

In conclusion, the present study provides valuable information about the relationships among acculturative stress, Chinese proactive coping, future time perspective, and subjective well-being in Chinese international students. The findings provide valuable insight into a proactive coping strategy within a Chinese cultural context that influences positive mental health outcomes of Chinese international students studying in the U.S. As this population continues to grow, it is crucial for researchers and practitioners to become more aware of the unique stress as well as coping strategies for this population.

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