

Acculturative Stress of Asian International Students before and during the COVID-19 Pandemic

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Abstract

Acculturative stress may hamper international students' ability to succeed in the United States of America. This study analyzed the impact of a range of factors noted in the literature and compared the levels of stress they were related to before and during the COVID-19 pandemic. We collected three waves of data (total responses = 204) via an online survey from ten universities/colleges across different regions in the United States of America. The results indicated that English proficiency and sex predicted the overall acculturative stress of Asian international students, in which higher perceived English proficiency predicted a lower perceived acculturative stress, and female Asian international students experienced higher acculturative stress than males. Also, Asian international students are experiencing more sadness during the pandemic and their peers are more discriminated against during 2020. Thus, university administrators should promote English language programs and support services (e.g., gender specific student support) to effectively address Asian students' concerns.

Keywords: acculturative stress; covid-19 pandemic; Asian international students; higher education

Introduction

The Institute of International Education (IIE Open Doors, 2022) revealed that the greatest number of international students (i.e., over 50%) in the U.S. are from Asia (i.e., mainland China, 30.6%; India, 21.0%; South Korea, 4.3%; Vietnam, 2.2%; Taiwan, 2.2%; and Japan, 1.4%) and over 40% of them are from East-Asia. Several adaptive barriers and challenges, such as acculturative stress, have impeded the success of Asian international students' education in the U.S. (Constantine et al., 2004; Han et al., 2017; Wei et al., 2007; Young, 2017).

Acculturative stress is the stress from cultural conflicts when individuals have difficulties adapting to a new culture of the host society (Berry, 1997, 2003). Acculturative stress was found to be associated with Asian International students' academic difficulties (Hamamura & Laird, 2014; Melkonian, et al., 2019; Yan & Berliner, 2009), and psychological well-being (e.g., depression, anxiety, and sleep quality; Constantine et al., 2004; Hamamura & Laird, 2014;

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Jenny et al., 2003; Li, et al., 2019; Redmond & Bunyi, 1993; Taušová, et al., 2019; Wang, et al., 2012; Wei et al., 2007; Wei, et al., 2012). Moreover, acculturative stress was associated with problems in students' social lives and networks, such as lack of social support or difficulty in making new friends (Bertram et al., 2014; Hamamura & Laird, 2014; Kline & Liu, 2005; Wang & Mallinckrodt, 2006).

Notably, existing literature about the factors affecting Asian international students' acculturative stress indicates mixed findings, so the present study first re-examines the influences of a range of factors noted in the literature. More importantly, the COVID-19 pandemic has worsened the acculturative stress of international students, and they now have to face more challenges due to the pandemic. Such as Asian international students being subjected to racist aggression and perceived discrimination and psychological distress during the COVID-19 pandemic (Chu & Lu, 2021; Li, et al., 2021; King, et al., 2020; Mbous, et al., 2022; Xiong, et al., 2022). Therefore, the present study also aims to explore how Asian international students' acculturative stress levels changes before and during the COVID-19 pandemic.

Literature Review

Acculturation is the process of cultural, psychological, and social adaptation to a new culture (Berry, 1994, 2003, 2005). It is thought to produce dichotomous outcomes (Berry, 1992, 1997). In the context of a new culture, either the newcomers find a new behavioral repertoire quickly, or incompatible behaviors impede them. However, if an individual's original behavioral repertoire is not compatible with the new culture, acculturation conflict occurs. Usually, an acculturating person resolves this conflict by yielding to the dominant cultural and behavioral norms. Meanwhile, some people may withdraw from the acculturation process to terminate the conflict. When people experience severe cultural conflict, they experience acculturative stress. The term "culture shock" is also frequently used to describe acculturation stress in the literature (Oberg, 1960; Ward et al., 2005).

Factors that Influence the Acculturative Stress of International Students

According to previous Asian international student acculturative stress studies and related acculturation theories (Bai, 2016a; Berry, 1992, 1997, 2003; Kline & Liu, 2005; Wei et al., 2012; Wang et al., 2012), many factors can influence Asian international students' acculturative stress, including age, sex, socioeconomic status (SES), language proficiency, education, and length of time spent in the new culture.

The body of literature on the acculturative stress of Asian students has grown in the past few years, but the findings from these studies are inconsistent. For example, some studies (Kline & Liu, 2005, Wei et al., 2012) indicated that international students' acculturative stress was affected by age, sex, and length of time in the U.S. Also, female international students experienced higher acculturative stress than males (Kline & Liu, 2005; Lowinger et al., 2014) and length of time in the U.S. positively related to international students' acculturative stress (Wei et al., 2012). Additionally, studies (Wei et al., 2012; Li et al., 2013) indicated that younger Asian international students had higher stress levels than their older counterparts. In contrast, other studies (Chae & Foley, 2010; Wei et al., 2007; Yeh & Inose, 2003) showed that the aforementioned factors did not relate to acculturative stress. Moreover, factors such as education level and SES have been infrequently investigated by empirical studies, although previous acculturation theories indicated that higher education and SES are associated with less stress in acculturation (Beiser et al., 1988; Berry, 1997).

There is a consensus on the impact of language proficiency on Asian international students' acculturative stress (Bai, 2016; Jin & Liu, 2014; Lowinger et al., 2014; Lueck & Wilson, 2010; Martirosyan et al., 2015). Linguistic factors, such as language proficiency, can predict acculturative stress (Berry, 1992, 1997). A lack of English proficiency is one of the strongest predictors of acculturative stress for Asians (Bai, 2016; Lueck & Wilson, 2010). Additionally, English proficiency is often associated with Asian international students' psychological well-being (Yan & Berliner, 2009; Wei et al. 2012). A number of studies (Yan & Berliner, 2009; Wei et al. 2012) used perceived English proficiency to measure international students' language proficiency and some studies (Bai, 2016a; Wang et al., 2012) asked international students to report their standardized English test scores (e.g., TOEFL). It was found that students standardized English test scores were not related to acculturative stress among Asian international student (Bai, 2016a; Wang et al., 2012). Although both

studies used outdated test scores (from tests taken before the students came to the U.S.), this contradiction of general trends indicates that students perceived English proficiency or comfort in using English influences on their acculturative stress more than their tested proficiency (Lin, 2006; Zhang & Jung, 2017).

Acculturative Stress of Asian International Students during COVID-19

The influence of the COVID-19 pandemic on Asian international students has also been studied in recent years. COVID-19 was first identified in Wuhan in late December 2019 and spread globally in early 2020, according to the World Health Organization (WHO, 2021). The COVID-19 pandemic has caused a significant health crisis, affecting all nations since the end of 2019 with over 223.02 million cases and over 4.60 million deaths reported to date (WHO, 2021). There have been at least 40.87 million cases in the U.S., and over 656,000 deaths were reported at the beginning of September 2021 (Centers for Disease Control and Prevention, 2021). Such widespread outbreaks have adverse mental health consequences (Rajkumar, 2020). Studies revealed that symptoms of anxiety, depression, and self-reported stress are common psychological reactions to the COVID-19 pandemic (Asmundson & Taylor, 2020; Bao et al., 2020; Rajkumar, 2020). Before COVID-19, psychological depression and anxiety were related to Asian international students' acculturation (Wei et al., 2007; Wei et al., 2012). Given that Asian populations face discrimination and isolation in some countries because they are deemed potential SARS-CoV-2 carriers (Zhai & Du, 2020), acculturation stress and related mental health issues may become more significant.

Experiences of prejudice and discrimination negatively affect individuals' well-being (Cormack et al., 2018; Halpern, 1993; Williams, 2018) and can place people who are exposed to a new culture at risk during acculturation (Beiser et al., 1988; Berry, 1997). For instance, the Asian population reported a much higher prevalence of racial discrimination in many Western countries (Cormack et al., 2018; Harris et al., 2019), especially in the U.S. due to historical stereotypes (Chen et al., 2020; Tessler et al., 2020).

Asian population in the U.S. are often stereotyped and have historically been viewed as perpetual foreigners, regardless of how long they have lived in the country (Chen et al., 2020; Tessler et al., 2020). They are seen as inherently different (Chen et al., 2020; Huynh et al., 2011). As COVID-19 sweeps through the U.S., this reality has become painfully apparent. A study (Tessler et al., 2020) has also shown that negative bias and aggressions against Asian Americans have increased during COVID-19. Since January 2020, the Asian population in the U.S. has reported a surge in racially motivated hate crimes, such as physical violence and harassment (Gover et al., 2020). Many individuals have reported suffering racial slurs because the media and government officials increasingly stigmatize and blame Asians for the spread of COVID-19 in the U.S. (Croucher et al., 2020). Comparing data for the first quarters of 2020 and 2021 across 16 major cities in the U.S., it was seen that there was a 164% increase in anti-Asian hate crimes reported to police (Center for the Study of Hate and Extremism, 2021).

How are Differences between Asian and U.S. Education System Related to Acculturative Stress of Asian International Students?

Educational systems grow from cultural expectations and ideologies (Kim, 2005), and the differences are vast between Eastern and Western educational systems due to the cultures they spring from. East Asian educational philosophy emphasizes that a strong work ethic and devotion to learning are more important to achievement than an inherently gifted mind (Kim, 2005). East Asian parents stress the importance of hard work to academic success and believe that good grades come from hard work and effort (Haynes & Chalker, 1998; Park & Kim, 1999). In contrast, American parents ascribe academic success to differences in native ability (Stevenson & Stigler, 1992).

Culture and the social system are also important components in shaping academic performance and behavior (Csikszentmihalyi, 2015). Asians may not think, feel, and act in a creative manner like Westerners because Asian society is tightly organized, collectivistic, and hierarchical (Rudowicz & Ng, 2003). In the collectivist context of East Asian societies, teachers are highly respected and never contradicted. Students expect the teacher to initiate communication, and

they speak only when their teachers ask (Kim, 2005; Park & Kim, 1999; Yook & Albert, 1998). Hierarchical relationships in the Asian culture (rooted in Confucianism) among East Asian classrooms, such as unequal relationships, gender role expectations, and authoritarian relationships between teachers and students, may inhibit student's learner autonomy and creativity (Kim, 2007). In contrast to most of East Asian education, the American educational system emphasizes learner autonomy and creativity by developing higher order thinking skills and by providing an environment that promotes free and open discussion and de-emphasizes rote memorization (Garkov, 2002; Jiang, et al., 2021; Moosavi, 2020).

Also, the exam-centric Asian education system negatively influences students who view education as nothing more than merely passing examinations (Kirkpatrick & Zang, 2011; Lim, 2010). The exam-oriented education system dominates different levels of education among East-Asian countries (Kirkpatrick & Zang, 2011; Tan, 2019) and stifles students' imagination, creativity, and sense of self which are crucial qualities for students' success in and out of the classroom (Kirkpatrick & Zang, 2011). Although many Asian countries reform the education system to revolve around improving school systems in the midst of new globalizing conditions, exam-driven culture is still predominant (Tan, 2019).

These differences between East-Asian and Western cultural and educational backgrounds cause Asian international students extra stress and anxiety when adapting to the U.S. classroom. Meanwhile, acculturative stress and the language barrier exacerbate Asian international students' stress and anxiety during the adaption (Wang & Mallinckrodt, 2006; Yan & Berliner, 2009).

The Current Study

The current study examined the influences of age, sex, education, length of United States residence, SES, and perceived English proficiency on acculturative stress among Asian international students. Further, the study also compared Asian international students' acculturative stress levels before and during the COVID-19 pandemic. The following research questions express these goals:

First, what factors influence the acculturative stress experiences of Asian international students? The previous literature has yielded inconsistent findings on the factors affecting international students' acculturative stress, such as sex and length of time in the U.S. More importantly, research results (Wei et al., 2007; Yeh & Inose, 2003) were inconsistent with some acculturation theories of Berry (1997, 2003). Some studies (Wei et al., 2007; Yeh & Inose, 2003) found that sex was not a significant predictor of acculturative stress and age did not correlate with acculturative stress among Asian international students but acculturation theories (Berry, 1997, 2003) indicated these factors would affect acculturative stress. We hypothesized at least one of the following factors (i.e., perceived English proficiency, age, sex, education level, and length of time in the U.S.) would influence Asian international students' acculturative stress experiences.

Second, are there any differences in the overall acculturative stress levels or specific indicators for Asian international students before and during the pandemic? Recent studies also revealed that global emergencies, such as the pandemic, influenced international students' acculturation experiences in the U.S., especially in the case of the Asian population. Asians have faced discrimination and isolation during the pandemic due to the perception that they are potentially carrying SARS-CoV-2 (Zhai & Du, 2020). Therefore, we hypothesized that Asian international students would have different experiences of acculturative stress during the pandemic.

Methodology

Sample

The study surveyed 360 Asian international students from 10 universities and colleges in the United States using convenience sampling and snowball sampling strategies. We excluded 156 participants from the sample because of incomplete survey responses, resulting in a final sample size of 204 (Wave 1 = 76; Wave 2 = 75; Wave 3 = 53) for final analyses. The participants were 24.49 ($SD = 4.44$) years old on average when they responded to the survey, and 126 of

Table 1*Academic Status of Participants*

Academic Status	N	%
Undergraduate	82	40.2
Master	88	43.1
Ph.D.	16	8.8
Optional Practical Training (OPT)	6	2.9
Language Program	3	1.5
Other	1	0.5
Missing	2	3.9
Total	204	100

Table 2*Country/Region of Participants*

SES	N	%
Mainland China	172	84.31
Taiwan	9	4.41
Hong Kong	4	1.96
Nepal	1	0.49
Indonesia	1	0.49
Japan	1	0.49
Other	16	7.84
Total	204	100

them were female (61.76%). They had been staying in the U.S. for 3.42 ($SD = 2.50$) years on average. Over half of them ($n = 110$, 53.92%) were graduate students (see Table 1). Nearly 47% of them ($n = 96$) reported a mid or upper SES. Most ($n = 172$, 84.31%) participants were originally from mainland China (see Table 2).

Measures

The Acculturative Stress Scale for International Students (ASSIS; Sandhu & Asrabadi, 1994) measured acculturative stress. Since it was published, ASSIS has been widely and most used scale to measure acculturative stress for international students (e.g., Iorga et al., 2020; Li et al., 2013; Li & Liu, 2021; Wang et al., 2021; Wang & Mallinckrodt, 2006; Wei, et al., 2007; Wei, et al., 2012). Each item was rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total possible score ranged from 36 to 180 (36 items) on this scale (attached in Appendix), comprising seven subscales: Perceived Discrimination, Homesickness, Perceived Hate, Fear, Stress due to Culture Shock, Guilt, and Miscellaneous. Besides the total score, subscale scores were calculated. A higher score indicates the subject experienced a greater level of acculturative stress. We provided translated surveys and the original English version to all participants during data collection. They were able to choose the version they preferred. The survey was translated and validated by authors fluent in both languages with lived experiences in both cultures. The scale demonstrated high reliability across the three-wave data collection (Cronbach's $\alpha = .93$), similar to previous studies investigating international students, in which the coefficient ranged from .92 to .94 (e.g., Wei et al., 2007). Meanwhile, high reliability was also demonstrated within each wave of the data collection. From Wave 1 to Wave 3, the reliability was .93, .94, and .91, respectively.

Also, a self-reported question, "What is your current level of fluency in English?" was included in the survey. English proficiency was measured by a 4-point Likert scale (1—poor, 2—fair, 3—good, 4—excellent). An average English proficiency score of 2.71 out of 4 ($S.D. = .82$) was reported.

Procedures

The Institutional Review Board approved the study. The data was collected via the online platform *Qualtrics* during three time periods: before the pandemic (before 2019), the early global pandemic (December 2019–March 2020), and when the pandemic hit U.S. (April 2020–June 2020). The survey was distributed via social media platforms (WeChat, LINE, and Facebook) to students from multiple universities to reach a larger Asian international student population. Additionally, snowball sampling was implemented to maximize survey dissemination within the target population. Notably, Wave 1 data were collected before the COVID-19 pandemic, prior to 2019; Wave 2 data were collected when the pandemic was occurring widely, but not intensely in the U.S. (World Health Organization, 2020); Wave 3 data were collected upon the outbreak of the pandemic in the U.S. (Centers for Disease Control and Prevention, 2022). Most states in the United States began to lock down before the Wave 3 data collection.

Analysis Overview

We used stepwise multiple regression to examine the factors that influence acculturative stress (Research Question 1). Multiple regression models were constructed to explore whether sex, age, SES, and education level predicted students' acculturative stress. Whether these factors influenced their acculturative stress experiences was also evaluated. The literature indicates mixed findings on the factors affecting students' acculturative stress. Therefore, stepwise regression is an efficient way to manage this situation. Stepwise regression procedures help select the most significant factors predicting Asian international students' acculturative stress.

To address the second research question, Asian international students' acculturative stress levels, patterns, and indicators were compared using t-tests and analyses of variance (ANOVA). These comparisons explored differences in the acculturative stress experiences of Asian international students across different time points of the COVID-19 pandemic in the U.S. (Waves 1, 2, and 3). In addition, t-tests were conducted to compare acculturative stress indicators before and during the pandemic (Wave 1 vs. Waves 2 and 3). Data analysis was performed using IBM SPSS Version 24 (IBM Corp., 2016).

Results

Descriptive Statistics

Female Asian international students ($M = 98.60$, $SD = 18.46$) reported higher acculturative stress scores than their male counterparts ($M = 97.38$, $SD = 23.28$). Meanwhile, undergraduate Asian international students ($M = 100.71$, $SD = 17.51$) reported higher acculturative stress scores than graduate students ($M = 95.49$, $SD = 22.16$). Additionally, Asian international students with a higher SES were more likely to perceive lower acculturative stress. Moreover, Asian international students' acculturative stress scores were different between the waves of data collection. Wave 1 ($M = 99.55$, $SD = 20.82$) reported the highest acculturative stress, compared to Wave 2 ($M = 96.88$, $SD = 21.11$) and Wave 3 ($M = 96.40$, $SD = 18.38$).

Correlations Between Variables

We examined relationships between the target variables and tested covariates using Pearson and Spearman correlations. The results (Table 3) show that the targeted influencing factors were significantly related to important patterns; for example, students' sex was significantly related to cultural shock. Education level was significantly related to guilt and various aspects of acculturative stress. Participants' perceived SES was significantly related to their homesickness, cultural shock, and perceived English proficiency. Meanwhile, the region (studying on the West coast of the U.S. or not) of the sample was positively related to their age and years in the U.S. but negatively related to aspects of acculturative stress and perceived English proficiency.

Table 3*Correlation Matrix of Acculturative Factors and Demographics*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Acculturative Stress Total	1														
2. Discrimination	.827**	1													
3. Homesickness	.617**	.287**	1												
4. Hate	.817**	.742**	.299**	1											
5. Fear	.815**	.567**	.517**	.615**	1										
6. Culture Shock	.686**	.422**	.625**	.379**	.507**	1									
7. Guilt	.682**	.459**	.534**	.485**	.522**	.490**	1								
8. Miscellaneous	.896**	.692**	.409**	.704**	.709**	.510**	.552**	1							
9. Age	-0.08	.034	-.116	-.028	.008	-.041	-.031	-0.072	1						
10. Years in the United States	.260	-.044	-.092	-.017	-.015	-.123	-.044	-0.126	.671**	1					
11. Sex	.030	.052	.072	-.037	.002	.142*	-.055	.054	.054	.133	1				
12. Education	.678	-.013	-.054	-.106	-.054	-0.08	-.174*	-.189**	.155*	.058	.023	1			
13. SES	-.139	-.096	-.198*	-.045	-.090	-.213*	-.136	-.166	-.001	.107	.023	.089	1		
14. English Proficiency	.067	.105	-.059	.031	-.013	.096	.121	.089	-.218**	-.208**	.078	-.213**	.375**	1	
15. Region (West Coast)	-.125	-.026	-.037	-.04	0	-.129	-.073	-.188*	.656**	.922**	.071	.083	.073	-.361**	1

N = 63 – 204; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Factors that Influence Acculturative Stress

The results of the stepwise regression revealed two possible significant models as candidates for the final model (Table 4) predicting overall acculturative stress. Model 1, $F(1, 58) = 9.500, p = .003$, included only one predictor, English proficiency ($\beta = -0.375, t = -3.082, p = .003$) and explained 14.1% of the total variance in acculturative stress. Model 2 was selected as the final model because of its higher R-square, which explained 19.9% of the total variance of the acculturative stress, $F(1, 57) = 7.062, p = .002$. Model 2 included two significant predictors, namely, English proficiency ($\beta = -0.334, t = -2.773, p = .007$) and sex ($\beta = 0.244, t = 2.028, p = .047$). These significant predictors indicated that higher perceived English proficiency predicted lower perceived acculturative stress, and female Asian international students experienced higher acculturative stress than males.

Table 4.*Regression Model Summary*

Model	Predictor	B	S.E.	Beta	t	Sig	R ²	R ² Change	F	Sig	F Change	Sig. F Change
1							.141	.141	9.500	.003	9.500	.003
	Constant	.961	.360		2.669	.010						
	English Proficiency	-.394	.128	-.375	-3.082	.003						
2							.199	.058	7.062	.002	4.114	0.047
	Constant	.525	.411		1.276	0.207						
	English Proficiency	-.351	.126	-.334	-2.773	0.007						
	Sex	.467	.23	.244	2.028	0.047						

Time Point Differences Among Acculturative Stress Indicators and Scores

ANOVA and t-tests evaluated differences in overall stress, acculturation patterns, and other indicators between different data collection time points. Acculturative stress patterns, such as cultural shock and homesickness, were compared using ANOVA over three data collection waves.

Asian international students' overall perceived acculturative stress was not significantly different during the various stages before and during the COVID-19 pandemic. However, ANOVA results show that their acculturation experiences were different during different stages of the COVID-19 pandemic. They reported more perceived more sadness when living in unfamiliar surroundings, $F(2, 201) = 4.87, p = 0.009$, while the pandemic was prevalent elsewhere (Wave 2; $M = 2.84, SD = 1.13, p = .043, d = 0.39$) and in the USA (Wave 3; $M = 2.96, SD = 1.02, p = .013, d = 0.53$) compared with the pre-pandemic period (Wave 1; $M = 2.42, SD = 1.02$). They also reported they had clearer plans ($M = 2.80, SD = 1.12$) at the time of Wave 3 regarding their future and whether to stay in the U.S. or go back to their home countries, $F(2, 192) = 3.48, p = 0.03$, compared with Wave 1 ($M = 3.40, SD = 1.15, p = .025, d = 0.53$). However, the participants reported that they perceived less unequal treatment, $F(2, 201) = 3.59, p = 0.029$, during the pandemic in the USA (Wave 3; $M = 2.40, SD = 0.86, p = .022, d = 0.51$) than before the pandemic started (Wave 1; $M = 2.87, SD = 0.98$).

T-test results also showed that the acculturation experiences of students were different prior to (Wave 1) and during the pandemic (Waves 2 and 3). They reported they perceived more sadness when living in unfamiliar surroundings in the United States during the pandemic ($M = 2.89; SD = 1.08$) compared with the pre-pandemic situation ($M = 2.42; SD = 1.02$) at $p = .003, t = -3.06, df = 202, d = 0.45$. Meanwhile, they felt that their peers are more discriminated against during the pandemic ($M = 3.00; SD = 1.01$) compared to before it ($M = 2.65; SD = 1.11$) at $p = .024, t = -2.28, df = 200, d = 0.35$.

However, they also reported they felt less intimidated about participating in social activities ($M = 2.78; SD = 1.11, p = .033, t = 2.14, df = 201, d = 0.31$), and they perceived being treated less differently in social situations ($M = 2.79; SD = 0.95, p = .018, t = 2.39, df = 202, d = 0.35$) during the pandemic compared with before it ($M = 3.12, SD = 1.06; M = 3.12, SD = 0.95$).

Further, fewer students reported they felt many opportunities are denied to them during ($M = 2.71; SD = 1.01$) at $p = 0.011, t = 2.57, df = 202, d = 0.38$, compared with prior to the pandemic ($M = 3.08; SD = 0.96$). Additionally, they reported less unequal treatment during the pandemic ($M = 2.54; SD = 1.00$) at $p = .023, t = 2.29, df = 202, d = 0.24$, compared with before it ($M = 2.87; SD = 0.98$) and reported that they relocated less frequently out of fear of others during the pandemic ($M = 1.84, SD = 0.83, p = .035, t = 2.12, df = 200, d = 0.30$), compared with before it ($M = 2.09; SD = 0.85$). In addition, Asian international students reported they had clarified their plans, that is, whether to stay in the U.S. or to go back their countries of origin during the pandemic ($M = 3.01; SD = 1.25$) at $p = .03, t = 2.19, df = 193, d = 0.32$, compared with prior to it ($M = 3.40; SD = 1.15$).

Discussion

Factors that Influence Acculturative Stress

The first research question concerned factors that influence the acculturative stress experiences of Asian international students, including length of time in the U.S., sex, age, SES, education level, and English proficiency. The regression analyses revealed that English proficiency and sex were significantly associated with international students' acculturative stress. International students who reported higher English proficiency experienced lower acculturative stress, which echoes the findings in previous studies (Bai, 2016; Hamamura & Laird, 2014; Jin & Liu, 2014; Wei et al., 2012).

Moreover, we also found that female Asian international students experienced higher acculturative stress than males, which is consistent with previous studies that state the same (Kline & Liu, 2005; Lowinger et al., 2014). A possible reason for this difference is that females may be more vulnerable than males during acculturation because of variations in social status in different cultures. Women play multiple roles in different social contexts, and these differences can get

them involved in cultural conflict more easily (Beiser et al., 1988; Berry, 1997; Carballo, 1994). Additionally, females have a lower social status than males in traditional Asian cultures (Kim et al., 2001). Therefore, when females attempt to take different roles in new cultures, they may come into conflict with their culture of heritage and causing maladaptation (Berry, 1997; Naidoo, 1992). Besides, females are more efficient than males in expressing and processing their emotions (Collignon, et al., 2010) and females have higher emotional expressivity, particularly for negative emotions (Deng et al., 2016). As a result, female participants were more likely to report their stress.

Other factors, including length of time in the USA, age, SES, and education level, were not related to acculturative stress in this study. The lack of variance among these variables may explain the inconsistencies. For example, the sample's average age was 24.49 years, and almost all participants had received at least undergraduate education. When acculturation begins earlier than primary school age, the process will generally be smooth (Beiser et al., 1988). When acculturation occurs during adolescence or late in life, such as during retirement, people are more likely to experience difficulties (Aronowitz, 1992; Beiser et al., 1988; Berry, 2001; Sam & Berry, 1995). Notably, this study did not include any adolescents or retirees. The lack of variance in age may have resulted in this inconsistency. Several studies (Chae & Foley, 2010; Wei et al., 2007; Yeh & Inose, 2003) that surveyed a similar sample yielded results akin to that of the current study, suggesting that age does not influence the acculturative stress of Asian international students. Besides, the current study sample was college-educated, and half were graduate students. Accordingly, a higher level of education may not influence the acculturative stress of Asian international students.

Previous research has suggested that length of acculturation may strongly affect the kind and extent of problems that someone experiences (e.g., Berry, 1997, 2003; Wang & Mallinckrodt, 2006). However, the current study does not support this. The current study sample consisted of students who resided in the U.S. for an average of 3.42 year, rather than long-term immigrants, and none of them had stayed in the U.S. for more than 10 years. Du and Wei's (2015) study showed similar findings (i.e., length of time did not relate to acculturative stress).

Many previous studies have shown that a low level of perceived English proficiency may strongly influence Asian international students' acculturative stress (e.g., Bai, 2016; Han et al., 2017; Lueck & Wilson; 2010). As a linguistic factor, English proficiency may be one of the strongest predictors of acculturative stress for Asians. Notably, other studies (e.g., Bai, 2016a; Wang et al., 2012) showed that students' English standard test scores (e.g., TOEFL) were unrelated to acculturative stress among Asian international students. Current study did not survey the participants' standardized English test scores. One reason is that, most international students' TOEFL scores represent their English level before coming to the U.S. Such test scores are outdated and may not represent their English proficiency at the time of their participation in the survey. Perceived English proficiency also indicates that comfort in using English is important influence on acculturative stress (Lin, 2006; Zhang & Jung, 2017). Therefore, future researchers should prioritize the impact of English proficiency measured by standardized tests on students' acculturative stress and on how their comfort with English affects acculturative stress.

Acculturative Stress and the COVID-19 Pandemic

The second research question concerned the differences between Asian international students' acculturative stress levels and indicators before and during the COVID-19 pandemic. Although the overall perceived acculturative stress was not significantly different before and during the pandemic, the participants' specific experiences differed significantly.

First, participants reported they felt more sadness during the pandemic. There are several explanations from the recent literature for this difference. First, Asmundson and Taylor (2020) indicated that symptoms of anxiety and depression are common psychological reactions to the COVID-19 pandemic. Also, Asian populations face discrimination and isolation due to being considered potential SARS-CoV-2 carriers (Croucher, et al., 2020; Koo & Nyunt, 2022; Zhai & Du, 2020), and Asians have historically been treated differently (Chen et al., 2020; Huynh et al., 2011). Additionally, homesickness is another challenge that international students may encounter when they leave home and live far away from their families and friends (Billedo et al., 2020). During COVID-19, international students perceived feelings of isolation and loneliness due to limited opportunities for social interactions. Moreover, international student status, being

far from family or having limited connections with domestic peers exacerbated their perceived loneliness (Koo & Nyunt, 2022). Accordingly, international students had more concerns about contact with loved ones and travel compared to domestic students during the COVID-19 pandemic. There were greater barriers to international students' contact with family and friends in their home countries, including travel bans, travel safety, and the need for visas (Hawley, et al., 2021). These factors may explain why they felt more sadness during the pandemic. Asian international students also reported they felt their peers were more frequently discriminated against during 2020. As mentioned earlier, recent studies indicated that xenophobia and hate toward Asians increased during the pandemic in the U.S. (Le et al., 2020), with Asian populations in the U.S. reporting a surge in racially motivated hate crimes, including physical violence and harassment (Gover et al., 2020).

The survey also asked whether they worried about their future for not being able to decide whether to stay here or to go back. Another difference we observed was that participants reported they had clarified their future plans during the pandemic, even though the survey results did not indicate whether they preferred to stay in or leave the United States. According to a recent report (U.S. News & World Report, 2020), overall and new international students' enrollments for the 2020–2021 academic year declined. Overall international student enrollment decreased for the first time since the 2005–2006 academic year. The pandemic could be one of the reasons for the decrease in the number of Asian international students in the U.S.. However, the U.S. News and World Report article (2020) indicated the political climate in the USA might cause concern for Chinese international students, who comprise the United States' largest Asian international student population (IIE, 2020). Therefore, various situations in 2020 caused these students to be firm in their decisions about their future, whether they decided to stay in the U.S. or go back to their home countries.

There were also some positive aspects in the survey results. Asian international students reported fewer discrimination-related experience during the pandemic; for example, they reported they received less unequal treatment in 2020, felt less intimidated about participating in social activities, and were treated less differently in social situations. The reason for this could be that much of the U.S. was in lockdown during this time, and people had to stay at home to quarantine themselves. Therefore, there were fewer opportunities to participate in in-person social activities. Asian international students may have had fewer chances to be involved in in-person discrimination-related experiences. However, they may have received information from social media and news about how the Asian population was experiencing discrimination.

Since January 2020, many Asian Americans or Asians have reported suffering racial slurs, physical violence, and different kinds of discrimination as media and government officials stigmatize and blame Asians for the spread of COVID-19 (Croucher, et al., 2020). The links between prejudice/hate toward Asians and social media are evident, the more a social media user believes their most used daily social media is fair and accurate, the more likely they are to blame Asians for the spread of COVID-19. The COVID-19 outbreak also gave rise to a worldwide series of discriminatory and racist attacks against Chinese people and people with Asian-appearing features (Devakumar, et al., 2020; Tanaka, et al., 2020). These attacks have not been restricted to physical space but have also extended to social media (e.g., discrimination-related hashtags have been trending on Twitter since January 2020; Li, et al., 2021; Stechemesser et al., 2020).

Further, COVID-19-related media use was a stressor during the U.S. pandemic and lockdown, and perceived hostility from Asian social medias led to stronger psychological distress among U.S.-dwelling Asians (Chu & Lu, 2021). During critical times like the COVID-19 pandemic, being overloaded with information, especially from sometimes contradictory sources, may lead to cognitive dissonance and stress (Case et al., 2005). Because of the widespread pandemic misinformation (e.g., conspiracy theories), heavier media use may lead to more stress (Chu & Lu, 2021). Identifying with their original and U.S. cultures may enhance international students' sense of belonging (Chen, et al., 2008), while exposure to U.S. media coverage on the pandemic may be more detrimental to their psychological well-being and make them more stressed about the pandemic because of stronger personal relevance (Chu & Lu, 2021).

This topic was frequently discussed in the mainstream media and mixed with sometimes contradictory sources and misinformation, explaining why participants reported fewer self-involved discrimination-related experiences. Still, they felt their peers, rather than they themselves, experienced more discrimination during the pandemic.

Asian international students perceived a less discriminatory experience during the pandemic lockdown time. This indicates that Asian international students may have been discriminated against not just because of the pandemic. Racial discrimination against Asians in the U.S. was broadly studied before the pandemic (Hwang & Goto, 2008; Lee & Ahn, 2011; McMurtry et al., 2019) and is a historical issue. Asians in the U.S. experience discrimination interpersonally and across many institutional settings (McMurtry et al., 2019). Perceived racial discrimination contributes to negative mental health outcomes (Hwang & Goto, 2008; Lee & Ahn, 2011; McMurtry et al., 2019), such as higher psychological distress, anxiety, and depression, and perceived racial discrimination may lead to chronic illness (Gee et al., 2007).

Participants in the current study were self-selected rather than randomly selected. Hence, the sample might not adequately represent Asian international students—many previous Asian international acculturation studies did not employ a random sampling (Bai, 2016; Wei et al., 2012; Wei et al., 2007).

English Proficiency, Acculturative Stress, and Cultural Background

Although the current study did not directly examine how Asian international students' cultural background influenced their acculturative stress, we demonstrated that the level of English proficiency was a significant predictor of acculturative stress among Asian international students. According to previous studies (Wang & Mallinckrodt, 2006; Yan & Berliner, 2009), low English proficiency may exacerbate Asian international students' maladaptation and acculturative stress due to different cultural backgrounds and education systems. For example, some East Asian students hesitate to speak in class or initiate communication with professors because of the East Asian education system's influence (Kim, 2005; Park & Kim, 1999). In Asian cultures and classrooms, because of hierarchical relationships between teachers and students, students expect their teacher to initiate communication or ask them to speak vs. students initiating communication with or questioning their teacher (Kim, 2007; Park & Kim, 1999; Yook & Albert, 1998). Moreover, with the language barrier, Asian international students may feel less comfortable talking in class. In these situations, English proficiency is not the only factor affects their adaption and acculturation in the U.S. Their comfort in using and speaking English with others is also an important influence on acculturative stress (Lin, 2006; Zhang & Jung, 2017), and cultural barriers may worsen this maladaptation. Hence, English proficiency, comfort in speaking English, and cultural barriers may impede their communication with teachers.

Implications, Limitations, and Future Directions

In our examination of factors influencing acculturation, one major issue was the lack of diversity and the small sample size. To thoroughly evaluate factors such as age, length of residence, and education on Asian international students' acculturative stress, a more diverse sample is needed. This expansion would increase complexity in the study variables (e.g., adding more age groups and long-term immigrants). Also, a larger sample size would strengthen the examination of the above factors because it would allow for more sophisticated statistical analyses and more robust models. Repeated measures should be considered in future research to better track and compare acculturative stress over time. This method could exclude influences of confounding variables, even though the data collection method may be more challenging to implement, especially when working to accrue a large sample. Besides, convenience and snowball sampling may limit the generalizability of current findings because the sample may not fully represent the Asian international population. Additionally, university administrators should promote English language programs and support services to address Asian students' concerns about acculturative stress. These programs and support services should help Asian international students feel more comfortable speaking English and help them get involved in social activities with local students. More importantly, in terms of comparing international students' educations in the U.S., improving English proficiency is important but by itself does not seem to be enough to ensure that they adapt smoothly to their U.S. lives among Asian international students. Learning and understanding the educational system and cultural background in the U.S. is also essential for Asian international students' adaption and acculturation. Accordingly, university administrators may also consider embedding cultural learning into English language programs and support services.

Because of the COVID-19 pandemic, the status of the Asian population has drawn increased attention from politicians and the general population in the U.S.. As a result, the federal government is addressing hate crimes directed at Asians through legislative actions (Edmondson, 2021). Therefore, post-COVID-19 studies are necessary to follow up on new trends related to this topic.

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