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Meta-Analysis of Asian Students' Acculturative Stress in U.S. Higher Education

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Introduction

College can be a difficult time, and college life is a time of increased vulnerability to peer influence, the stress of identity development (Claudat, White, & Warren, 2016), academic pressure, financial pressure (Lantrip et al., 2015), and a number of mental health problems (Polanco-Roman & Miranda, 2013). Previous research studies indicate that students of color in higher education are likely to experience more stress than students of European descent (Kim, 2011; Lester, Walker, Gençöz, & Vatan, 2014; Saldaña, 1994; Wei et al., 2007). One ethnic group that has received little attention in this regard is Asians (Lantrip et al., 2015). Asian international students make up about 68% of the 1,078,822 international students in the United States (Institute of International Education, 2017). Moreover, Asians Americans are expected to account for 9.3% of the U.S. population in 2060 and to remain the second fastest growing group in the number in the U.S. (Colby & Ortman, 2014). More research is needed, especially considering the rapid growth in the number of Asian students to understand their process of adapting to a U.S. higher education environment, which is new cultural, social, and educational setting for Asian students.

Acculturative stress is one of the predominant factors that affects students' adaptation to a new environment. Acculturative stress refers to "one kind of stress, in which the stressors are identified as having their source in the process of acculturation (Berry, 1995, p. 479). Acculturation is defined as "a dual process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members" (Berry, 2005, p. 698). The incongruence between Asian students' home and American culture can lead to stress in the process of acculturation (Park, 2009). According to research, it is widely believed that students of Asian descent experience high levels of acculturative stress in American higher education institutions dominated by European Americans (Hamamura & Laird, 2014; Polanco-Roman & Miranda, 2013). However, effect sizes in many of the studies have ranged widely, and the use of different measures of acculturative stress makes comparison among studies challenging. Furthermore, comparisons between Asians and other ethnic groups in higher education are limited, and the results are inconsistent (Poyrazli, Kavanaugh, Baker, & Al-Timimi, 2004). For example, Van Diest and colleagues (2014) indicated that Asians were likely to report a higher level of acculturative stress in comparison with Hispanics and Africans. However, in another study that investigated the relationship between acculturative stress and depression, Asian groups experienced a lower level of acculturative stress than Hispanics and Africans (Constantine, Okazaki, & Utsey, 2004). Therefore, such contradictory results warrant an exploration of ethnic differences in acculturative stress. Accordingly, the purpose of the present research was to provide additional evidence about Asian students' acculturative stress when compared to other ethnic groups by using meta-analysis approach to provide estimates of the magnitude of each cultural group's differences. For that purpose, three research questions guided the study. First, does acculturative stress of Asian students in higher education differ from that of Hispanic

group? Second, does acculturative stress of Asian students in higher education differ from that of African group? Third, does acculturative stress of Asian students in higher education differ from that of European group?

Literature Review

Acculturation and Acculturative Stress

Students from different cultural environments face a number of cultural and academic challenges related to acculturation, which is defined as "cultural adaptation that occurs as a result of contact between multiple cultures" (Miller, 2007, p. 118) and as "cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members" (Berry, 2005, p. 698). Students need to adapt to a new environment, and they have to learn and accommodate to the host culture (Ye, 2005). The physical and psychological demands for acculturation cause acculturative stress (Han, Pistole, & Caldwell, 2017), which is emotional and physical (Berry, 2005). Acculturative stress is a reaction to life events caused by intercultural contact (Berry, 2003). It leads to such negative emotions as depression, anxiety, feelings of marginality, alienation, and identity confusion (Berry, 2003; William & Berry, 1991). Thus, acculturative stress reduces physical, psychological, and social aspects of the health status of individuals (Berry, 2003; Berry, Kim, Minde, & Mok, 1987).

Asian Students' Learning and Acculturative Stress

Previous literature has indicated that students of Asian descent experience more acculturative stress due to pronounced cultural differences between their home and host nations (Leong, 2015; Wei et al., 2010; Yan & Berliner, 2013). Asian students' acculturative stress often derives from learning styles, classroom expectations, and faculty student interaction norms that are different from those of the American higher education environment (Han et al., 2017). Asian students' learning styles have been affected by Confucianism, which values collectivism, harmony, and hierarchy. With these values, students of Asian descent are likely to work diligently, defer to teachers, seek to harmonize, prefer to learn collectively (Choi, 2015; Wang, 2006). On the other hand, European Americans emphasize individualism, individual development, mutual communication, and active participation in class since Western teaching models stress these values. Therefore, when functioning in Western culture, many Asian students seem to be passive, quiet (Wang, 2006), marginalized (Jun & Park, 2003), and inactive to seek help (Moon, Zhang, Larke, & James, 2019). Asian students think Western learning approaches, including critical thinking and debates, are aggressive and hurtful to their peers (Tan, 2017).

In sum, studies cited in the previous paragraph (Han et al., 2017; Jun & Park, 2003; Wang, 2006) revealed distinct cultural differences in education between Asian and Western countries, which may cause a high level of acculturative stress of Asian students living in the U.S. When Asians' acculturative stress was compared to that of other groups, students of Asian descent steadily reported greater acculturative stress than did students of European descent, but the effect sizes within the studies varied (Hamamura & Laird, 2014; Kim, 2011; Lantrip et al., 2015; Polanco-Roman & Miranda, 2013; Rogers-Sirin, 2013). Moreover, results of group comparisons between Hispanics or Africans and Asians in terms of acculturative stress in higher

education were not consistent. To be more specific, Constantine et al. (2004) noted that Hispanics had significantly higher acculturative stress scores than Asians. However, Polanco-Roman and Miranda (2013) as well as Rogers-Sirin (2013) found no statistical difference between Asians and Hispanics, and Claudat et al. (2016) stated that Asians reported a higher level of acculturative stress than the Hispanic group. In terms of acculturative stress of Asians and Africans in higher education, Constantine and colleagues (2004), and Rogers-Sirin (2013) found no difference, while Van Diest and colleagues (2014) stated Asians reported a higher level of acculturative stress than Africans. Therefore, the purpose of this study was to aggregate the results of comparative studies of students of Asian descent's acculturative stress in higher education through a meta-analysis approach and to provide an estimate of the magnitude of difference among each cultural group.

Method

Inclusion Criteria

Criteria for inclusion in this review were that studies must be (a) peer-reviewed journal articles or doctoral dissertations published within the past two decades, 1998-2018, (b) written in English, and (c) quantitative. Moreover, they must have (d) participants enrolled in one of the following institutions of higher education: university, or community college, and (e) have compared students of Asian descent to at least one sample of participants with Hispanic, African, or European decent on a measure of acculturative stress, regardless of immigration status. Unpublished dissertations were included because publication bias could be minimized (Normand, 1999; Quintana, Vogel, & Ybarra, 1991; Smith & Egger, 1998; Thornton & Lee, 2000).

Procedures

The electronic databases of Education Source, Educational Administration Abstracts, Eric, PsycINFO, and Dissertation Abstracts Index were used to identify potential studies. Several keywords were used to search relevant studies. These words were: *acculturative stress* with *Asian*, with *higher education*, and with *college* or *university*. A total of 1,687 studies were found, and the abstract, method, and results of each study were reviewed. The articles were excluded, if they were only qualitative in nature, did not include the necessary statistical information, or did not include students of Asian descent in higher education. A number of variables were coded using coding sheets. These included author name, year of publication, sample size, mean age, race/ethnicity, sex ratio, visa status, level of institution, and instruments. Using these procedures, a total of 13 studies with 23 effect sizes were included in this study. Some studies in this meta-analysis considered their participants based on students' immigration status (i.e., U.S. citizens or international students); the other studies categorized ethnicities based on participants' ethnic identity regardless of their immigration status. Therefore, in this study, *Asian students* refers to Asian Americans, Asian international students, or students who identified themselves with an Asian group. *African students* in this study indicates African Americans, African international students, or students who identified themselves as African. *Hispanic students* refers to Hispanic American, Hispanic international students, or students who identified as Hispanic. In the same sense, *European students* refers to European

American, European international students, or students who identified as European.

Table 1. *Inclusion Criteria for Participants*

Index	Author	IMMIGRANT STATUS		ETHNIC IDENTITY
		U.S. citizens	International Students	
1	Chang (2003)	O		
2	Claudat et al. (2016)	O		
3	Constantine et al. (2004)		O	
4	Hahn (2010)		O	
5	Hirschel (2011)		O	
6	Hofmann (2010)		O	
7	Kim (2011)		O	
8	Lantrip et al. (2015)			O
9	Polanco-Roman & Miranda (2013)			O
10	Rogers-Sirin (2013)	O		
11	Van Diest et al. (2014)	O		
12	Wong et al. (2017)	O		
13	Yeh and Inose (2003)		O	

Analysis

For each study, Cohen's *d* and the 95% confidence interval (CI) for between-group differences on acculturative stress were calculated by using Excel. The standardized mean differences were used to calculate Cohen's *d* effect sizes from sample sizes, means, and standard deviations (Cohen, 1988). To calculate Cohen's *d*, differences in mean scores obtained by the Asian and the counterpart samples on acculturative stress measures were divided by their pooled standard deviation.

$$\text{Cohen's } d = \frac{\overline{X1}-\overline{X2}}{Sp} \quad (1)$$

Therefore, positive values meant higher scores for Asians than their counterparts. To correct sampling bias, Cohen's *d* effect sizes were converted to Hedge's g effect sizes which are given by the formula (Cohen, 1988; Lipsey & Wilson, 2001)

$$\text{Hedge's } g = [1-\frac{3}{4N-9}]\, ES_{sm} \quad (2)$$

where N is the total number of sample size, *ESsm* is the biased standardized mean difference that is Cohen's *d* in this study. According to Cohen (1988), .20 indicates a small effect size, .50 means a medium effect, and .80 indicates a large effect size. Effect sizes for each comparison are shown in Tables 2-4. Moreover, *Q*-tests and I^2 were used to test the heterogeneity. In addition, random effects models, rather than fixed effects models, were chosen because a fixed effects model uses participants as the unit of analysis and assumes one true effect size in the population studies sampled, and any random error is derived from only sampling error. A random effect model uses studies as the unit of analysis and assumes that the variability across studies is utterly random and the factors which bring differences cannot be identified (Lipsey & Wilson, 2001; Nguyen & Benet- Martínez, 2013). By random effect models, we were able to have greater generalizability beyond the studies included in the current meta-analyses. Lastly, Z-statistics were used for the weighted average effect size. *Q*-tests and Z-statistics were performed in the software program Review Manager, Version 5.3.

Results

Study 1: Asian Students vs. Hispanic Students

Responses were based on a total of 2,055 individual participants (Asians: 1,272, Hispanics: 783). For a measure of acculturative stress, five studies used the Societal, Attitudinal, Familial and Environmental Acculturative Stress Scale (SAFE; Padilla, Wagatsuma, & Lindholm, 1985). Two studies employed Acculturative Stress Scale for International Students (ASSIS; Sandhu & Asrabadi, 1998) and one study developed its own measure of acculturative stress for the study (Hofmann, 2010).

An overall homogeneity test of effect sizes using *Q* statistics, which has a chi-square distribution with its associated degree

of freedom (Konstantopoulos & Hedges, 2009), was statistically significant [$Q(7) = 32.92$, $p < .001$, $I^2 = 79\%$]. This indicates that the variability of the effect sizes was greater than would be expected from sampling error and there was a homogeneity across studies (Lipsey & Wilson, 2001). Thus, using the random effects model for this study was appropriate (Nam et al., 2010). For the overall mean effect size estimate, a total of 8 individual effect sizes were calculated (see Table 2.) The effect sizes ranged from $-0.37 \leq g \leq .73$, with positive value *g* indicating higher acculturative stress scores for Asians than for Hispanics. The overall mean effect size was 0.33 and 95% of confidence interval was from 0.10 to 0.55, meaning a small effect size (Cohen, 1988). In the random effects model, there was a significant difference of acculturative stress ($Z = 2.84$, $p < .01$) between Asians and Hispanics in higher education.

Table 2: *Effect Sizes for Comparison Between Asian Students and Hispanic Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Claudat et al. (2016)	.34	0.18	0.50
2	Constantine et al.(2004)	-0.37	-0.63	-0.11
3	Hofmann (2010)	0.52	0.16	0.87
4	Polanco-Roman and Miranda (2013)	0.73	0.22	1.23
5	Rogers-Sirin (2013)	0.38	-0.11	0.87
6	Van Diest et al. (2014)	0.55	0.24	0.87
7	Wong et al. (2017)	0.32	0.09	0.55
8	Yeh and Inose (2003)	0.35	0.01	0.60
	Total	0.33	0.10	0.55

Study 2: Asian Students vs. African Students

Responses were based on a total of 1,063 individual participants (Asians: 795, Africans: 268). For a measure of acculturative stress, five studies used SAFE (Padilla et al., 1985) and two studies used ASSIS (Sandhu & Asrabadi, 1998). Hofmann (2010) developed his own measure of acculturative stress for his study.

The analysis of sample heterogeneity was significant [$Q(5) = 49.82$, $p < .001$, $I^2 = 90\%$], indicating that the random effects model was appropriate to calculate the weighted average effect size. For the overall mean effect size estimate, a total of six individual effect sizes were computed (see Table 3.) The effect sizes ranged from $-.74 \leq g \leq .64$, with positive value *g* indicating higher acculturative stress scores for Asians than those for Africans. The overall mean effect size was 0.21, and 95% confidence interval was from -0.29 to 0.70. This result meant the effect was statistically not significant ($Z = 0.82$, $p > .05$). In other words, there is no statistical difference between students of Asian descent and African descent in the area of acculturative stress.

Table 3: *Effect Sizes for Comparison Between Asian Students and African Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Constantine et al. (2004)	-0.74	-1.03	-0.46
2	Hofmann (2010)	0.27	-0.10	0.64
3	Polanco-Roman and Miranda (2013)	0.38	-0.19	0.95
4	Rogers-Sirin (2013)	0.52	0.04	1.01
5	Van Diest et al. (2014)	0.64	0.32	0.96
6	Yeh and Inose (2003)	0.24	-0.15	0.62
	Total	0.21	-0.29	0.70

Study 3: Asian Students vs. European Students

Responses were based on a total of 1,917 individual participants (Asians: 1,319, Europeans: 598). For a measure of acculturative stress, three studies used SAFE (Padilla et al., 1985), three studies used ASSIS (Sandhu & Asrabadi, 1998), one study used Index of Life Stress (ILS) (Yang & Clum, 1995) and one study used the Acculturative Stress Measure (ASM) (Williams-Flournoy & Anderson, 1996). One study developed its own measure of acculturative stress to utilize for his study (Hofmann, 2010).

An overall heterogeneity test of effect sizes using *Q* statistics (Konstantopoulos & Hedges, 2009) was statistically significant [$Q(8) = 30.12$, $p < .001$, $I^2 = 73\%$], confirming that the random effects model is appropriate for this study. For the overall mean effect size estimate, a total of nine individual effect sizes were used (see Table 3.) The effect sizes ranged from $0.44 \leq g \leq 1.09$, with positive value *g* indicating higher acculturative stress scores for Asians than the scores for Europeans. The overall mean effect size was 0.76 and 95% confidence interval was from 0.55 to 0.98, indicating it was a large-sized effect. In the random effects model, there is a significant difference ($Z= 6.90$, $p < .001$) between students of Asian descent and European descent in terms of acculturative stress.

Table 4: *Effect Sizes for Comparison between Asian Students and European Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Chang (2003)	1.05	0.78	1.32
2	Hahn (2010)	0.44	0.25	0.64
3	Hirschel (2011)	0.92	0.38	1.46
4	Hofmann (2010)	0.65	0.35	0.95
5	Kim (2011)	1.09	0.49	1.70
6	Lantrip et al. (2015)	0.28	-0.01	0.57
7	Polanco-Roman and Miranda (2013)	0.64	0.21	1.06
8	Rogers-Sirin (2013)	1.07	0.65	1.49
9	Yeh and Inose (2003)	0.99	0.70	1.28
	Total	0.76	0.55	0.98

Discussion

The purpose of this study was to use a meta-analysis approach to aggregate the results of studies of Asians' acculturative stress to provide an estimate of the magnitude of difference between students of Asian descent and those of Hispanic, African and European descent. Research gaps demonstrated a need for further research on the acculturative stress of Asians when compared to other ethnic groups in higher education. The findings indicate that overall students of Asian descent reported significantly higher acculturative stress than students of Hispanic descent, and the effect size was small (*g*=o.33, 95 % CI 0.10, 0.55, z = 2.84, p<.05). There was no significant difference between students of Asian descent and African descent (*g*=o.21, 95 % CI -0.29, 0.70, z = 0.82, p>.05). Yet, when compared to students of European descent, Asians scored significantly higher on acculturative stress and its effect size was large (*g*=o.76, 95 % CI 0.55, 0.98, z = 6.90, p<.001). This finding aligned with previous studies (Polanco-Roman & Miranda, 2013; Poyrazli et al., 2004). Like similar studies, this study found that Asians experience significantly a higher level of acculturative stress than Hispanics and Europeans. Since acculturative stress occurs more frequently when individuals have greater cultural differences from the host country (Berry, 1980), students of Asian descent experienced more stress during the acculturation process (Poyrazli et al., 2004). Often students of Asian descent have Eastern cultural values which means that greater importance is placed on interdependent relationships, unity, and conformity (Polanco-Roman & Miranda, 2013), while Western culture values individualism, individual development, and critical thinking (Tan, 2017). These fundamental dissimilarities between Eastern and Western cultures may cause Asian students to experience higher levels of acculturative stress.

Limitations

Several limitations should be noted about the study. First, the small number of effect sizes does not allow us to apply additional meta-analytic procedures, such as examining the relationships between sample characteristics (e.g., sex, social economic status, immigration status, or level of cultural affiliation) and the results (Quintana

et al., 1991). For instance, the acculturative stress patterns may be varied based on U.S. citizenship status. Moreover, even in the same immigration status groups, age of moving to US, years lived in US, or an immigration generation may induce different results in terms of acculturative stress. Second, this study explored only a limited number of Asians in American higher education. Therefore, the current meta-analyses may be best generalized to students of Asian descent in higher education in the US, and not to all Asians in other education levels or outside of the US. Future research could take steps to resolve these issues.

Recommendations

While students are primarily responsible for adapting to U.S. academic context, our results highlight the need to promote sensitivity of educators and counselors to challenges students of Asian descent confront. As such, we make the following recommendations:

1. Educators in higher education should consider different teaching methods and strategies, and should have a knowledge base about learning styles of Asian students.
2. Faculty need to be aware of the discontinuity in the instruction between U.S. and Asian classes and become more sensitive to class assignments such as working on group projects, participating in class discussions and other class activities that require articulating their opinions and information before their instructor and peers (Gay, 2002).
3. Moreover, instructors and counselors who can help reduce acculturative stress for students of Asian descent need to find a proactive approach because some Asian students might not actively seek help (Kim, 2011; Moon et al., 2019).

Conclusion

In conclusion, the results of this meta-analysis indicated that students of Asian decent experienced a higher level of acculturative stress than Hispanics and Europeans, with small and large effect sizes. While this study noted that there were no significant differences between Asians and Africans, further investigation is needed that may explain this similar level of acculturative stress. Different educational settings and the identification of more specific characteristics in participants is necessary to examine subgroup differences within the Asian population. This could bring deeper understanding how subgroups of students of Asian descent adapt to acculturative stress. As noted in this study, students of Asian descent need more support from their educational environment including faculty, counselors, and their classmates related to their acculturative stress, and then, Asian students will continue to increase in higher education institutions in America.

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Appendix A

Table 1. *Inclusion Criteria for Participants*

Index	Author	IMMIGRANT STATUS		ETHNIC IDENTITY
		U.S. citizens	International Students	
1	Chang (2003)	O		
2	Claudat et al. (2016)	O		
3	Constantine et al. (2004)		O	
4	Hahn (2010)		O	
5	Hirschel (2011)		O	
6	Hofmann (2010)		O	
7	Kim (2011)		O	
8	Lantrip et al. (2015)			O
9	Polanco-Roman & Miranda (2013)			O
10	Rogers-Sirin (2013)	O		
11	Van Diest et al. (2014)	O		
12	Wong et al. (2017)	O		
13	Yeh and Inose (2003)		O	

Appendix B

Table 2: *Effect Sizes for Comparison Between Asian Students and Hispanic Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Claudat et al. (2016)	.34	0.18	0.50
2	Constantine et al.(2004)	-0.37	-0.63	-0.11
3	Hofmann (2010)	0.52	0.16	0.87
4	Polanco-Roman and Miranda (2013)	0.73	0.22	1.23
5	Rogers-Sirin (2013)	0.38	-0.11	0.87
6	Van Diest et al. (2014)	0.55	0.24	0.87
7	Wong et al. (2017)	0.32	0.09	0.55
8	Yeh and Inose (2003)	0.35	0.01	0.60
	Total	0.33	0.10	0.55

Appendix C

Table 3: *Effect Sizes for Comparison Between Asian Students and African Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Constantine et al. (2004)	-0.74	-1.03	-0.46
2	Hofmann (2010)	0.27	-0.10	0.64
3	Polanco-Roman and Miranda (2013)	0.38	-0.19	0.95
4	Rogers-Sirin (2013)	0.52	0.04	1.01
5	Van Diest et al. (2014)	0.64	0.32	0.96
6	Yeh and Inose (2003)	0.24	-0.15	0.62
	Total	0.21	-0.29	0.70

Appendix D

Table 4: *Effect Sizes for Comparison between Asian Students and European Students*

Index	Author	*g*	*CI (Lower)*	*CI (Upper)*
1	Chang (2003)	1.05	0.78	1.32
2	Hahn (2010)	0.44	0.25	0.64
3	Hirschel (2011)	0.92	0.38	1.46
4	Hofmann (2010)	0.65	0.35	0.95
5	Kim (2011)	1.09	0.49	1.70
6	Lantrip et al. (2015)	0.28	-0.01	0.57
7	Polanco-Roman and Miranda (2013)	0.64	0.21	1.06
8	Rogers-Sirin (2013)	1.07	0.65	1.49
9	Yeh and Inose (2003)	0.99	0.70	1.28
	Total	0.76	0.55	0.98