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Effects of Cultural Intelligence and Social Support on Adjustment of International Students in Higher Education

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To further the understanding of how individual differences among international students influence transitioning to a U.S. university, this quantitative study investigated whether cultural intelligence and social support directly influenced international students' adjustment to higher education, and whether social support moderated the relationship between cultural intelligence and adjustment. Participants included 306 international students at a Southwestern university with an average age of 25.82. Data were collected though an online survey and included a demographic questionnaire, the International Student Adjustment to College Scale, the cultural intelligence questionnaire, and the social support scale. The results of hierarchical multiple regression analyses showed cultural intelligence and institutional social support were significant predictors of international students' adjustment. With a higher level of cultural intelligence or social support from the university, participants were more likely to have a better adjustment to the university. There was no interaction effect between cultural intelligence and social support from family, non-family, and institution on international students' adjustment.

Since the late 1940s, the United States has become the global leader in hosting the largest number of international students, with students arriving from all over the world (Institution of International Education [IIE], 2016). International students need to face many transitional challenges, and adjust to the place, academic work, demands, and social environment of college. Differing from domestic students, international students need to adjust to being away from family and friends and must adjust to cultural differences in the country of study (Kaczmarek, Matlock, Merta, Ames, & Ross, 1994; Mesidor & Sly, 2016). Being knowledgeable about the needs of international students during their transition to a U.S. university helps educators and university staff and administrators provide support for international students in adjusting to campus life, thereby increasing students' success and retention. The current study focuses on international students' adjustment to studying at a higher education institution in the United States, with a focus on the role of students' cultural intelligence and their experiences of social support. With this study, we will examine whether cultural intelligence helps students adapt to the new educational experience (Earley & Ang, 2003).

Background and Rationale of Adjusting to International Study

Adjustment is a dynamic process where individuals adapt their thoughts or behaviors to create a good fit between their cultural expectations and expectations in their new environments (Berry, 1997; Ramsay, Jones, & Barker, 2007). According to the acculturation framework, adjustment is multifaceted and distinguishes between psychological and sociocultural adjustment (Berry, 1997; Berry, 2003; Schartner & Young, 2016). Psychological adjustment refers to a set of psychological outcomes and physical well-being, including personal satisfaction, physical and mental health, and a sense of cultural identity; sociocultural adjustment represents acculturating individuals' outcomes of fitting into new environments, including the ability to deal with daily life, school, and work (Berry, 1994; Berry, 1997; Berry, 2003; Ward & Kennedy, 1993). To capture international students' adjustment experience, academic adjustment is included as one important adjustment domain in the international students adjustment model (Schartner & Young, 2016). Academic adjustment describes international students' adjustment to academic environments and demands, and their satisfaction with general experience of attending the host university (Baker & Siryk, 1999; Gómez, Urzúa & Glass, 2014; Schartner & Young, 2016; Yu & Wright, 2016). The present study viewed the adjustment to the academic institution as a whole and employed an instrument measuring integrated adjusting experience.

International students attending a foreign university have to overcome a variety of difficulties in adjusting to novel environments during their cross-culture transition (Kaczmarek et al., 1994; Mesidor & Sly, 2016). They have to adjust to host cultures that influence living environments and interpersonal interactions. Geographically distant from familiar environments and social support, many international students experience a divergence between their original cultures in areas of roles, values, norms, attitudes, and expectations (Berry, 1997; Furnham, 2004). With the main purpose of attaining an academic degree, international students also experience academic pressures and adjustment difficulties, including unfamiliarity with new educational systems, self-autonomy development, self-doubts about academic capacities, and relationships with advisors and faculty (Duru, 2008; Kaczmarek et al., 1994; Mesidor &

Sly, 2016; Ramsay et al., 2007; Young, 2011; Yu & Wright, 2016). With a loss of social networks at home, international students may encounter difficulties in social adjustment, which describes to what extent and how successfully international students deal with relocation (the separation from home, family and friends), and their engagement in local social activities and environments (Gómez et al., 2014). Moreover, previous research demonstrates that international students experience more psychological problems than their domestic counterparts (Leong & Chou, 1996; Yeh & Inose, 2003).

Cultural Intelligence

Cultural intelligence is generally used in business literature and describes, assesses, and evaluates an employee's ability in completing tasks in other countries or with diverse colleagues (Earley, 2002; Earley & Ang, 2003; Tan, 2004). More than just understanding a foreign language or cultural differences, cultural intelligence requires individuals to create a mental framework for new situations involving unfamiliar cultures (Earley & Ang, 2003). CQ also is reflected by intention and action. A high cultural intelligence helps one's adjustment to new experiences and plays a role in an individual's motivation and capability to respond appropriately to cross-cultural situations (Earley & Ang, 2003).

Cultural intelligence includes three interactional elements: cognitive, motivational, and behavioral (Earley & Mosakowski, 2004). Cognitive cultural intelligence refers to cognitive processes in cultural differences. This facet of cultural intelligence is the most closely related to the traditional explanation of cognitive intelligence, such as acquiring knowledge of norms and practices in other cultures (Ang et al., 2007; Earley & Ang, 2003; Harrison & Brower, 2011). A high cognitive cultural intelligence reflects realization and understanding of similarities and differences across cultures (Ang et al., 2007).

The process of learning and adapting to new cultural surroundings is related to an individual's motivational cultural intelligence (Ang, et al., 2007; Earley, 2002; Earley & Ang, 2003). With a high motivational cultural intelligence, people are willing to direct their attention and cognition toward learning and functioning in new cultures. Further, motivational cultural intelligence is related to an individual's confidence in their effectiveness in across-cultural situations (Ang, et al., 2007).

Behavioral cultural intelligence reflects an ability to acquire and exhibit specific responses to cross-cultural situations. An individual verbally and non-verbally interacts with people from different cultures, such as using appropriate words and facial expressions (Ang, et al., 2007; Earley & Ang, 2003). These three facets make up the overall cultural intelligence as an aggregate multicomponent construct. A person will be described as having low cultural intelligence if one or more of the three elements are weak (Earley & Ang, 2003).

Cultural intelligence has been well documented in literature on relationships with cross-cultural tasks and adjustment in global business settings, but more empirical research is needed in exploring the role of cultural intelligence in international students' adjustment to academic institutions (Earley & Ang, 2003; Harrison & Brower, 2011; Lin, Chen & Song, 2012; Mesidor & Sly, 2016). A limited number of previous research focuses on cultural intelligence in education settings in order to extend the understanding how a high level of cultural intelligence benefits cross-cultural adjustment (Chen, Wu & Bian, 2014; Harrison & Brower, 2011; Lin et al., 2012). Absent in this research is a focus on the unique experiences associated with international study, where individuals pursue degrees in institutions outside their home country. This brings to the fore unique cross-cultural tasks necessary in achieving academic goals. Thus, this study included academic adjustment and institutional attachment to describe the overall adjusting outcomes among international students.

Social Support

A significant contextual factor in the acculturation model is social support (Berry, 1992; Berry, 1997). The positive role of social support in international students' adjustment to academic life has been emphasized in literature (Baba & Hosoda, 2014; Yeh & Inose, 2003). Social support contributes to the level of adjustment difficulties experienced by international students as they transition to academic institutions. In addition, social support contributes to international students' cross-cultural adjustment and plays a mediating role between loneliness and adjustment difficulties (Baba & Hosoda, 2014; Duru, 2008). Based on current research, an individual's perception of supportive contexts will help international students reduce the impacts of transitional stress on psychological well-being (Lee, Koeske, & Sales, 2004; Ramsay et al., 2007).

The sources of social support are considered important to international students in adjustment to a university outside their home country (Chavajay, 2013; Chen, Mallinckrodt, & Mobley, 2002). Families, partners, and friends are the main sources of emotional and practical support, which benefit international students' academic performance and mental health (Baba & Hosoda, 2014; Cemalcilar, Falbo, & Stapleton, 2005; Mallinckrodt & Leong, 1992). Relationships with other international students increase international students' senses of safety and belonging. Research found international students tended to build deeper

friendships with other international students than host nationals, and seek emotional and practical support mainly from international students, especially co-nationals (Chavajay, 2013; Chen et al., 2002; Hendrickson, Rosen, & Aune, 2011). However, social support mostly from international students was found to inhibit acculturation and harm long-term adjustment (Hendrickson, Rosen, & Aune, 2011; Poyrazli, Kavanaugh, Baker, & Al-Timimi, 2004).

Besides social support from individuals, contexts of settlement are also important sources for international students to seek support (Berry, 1997). International students are dependent on the host institution for their visa status and establishing of social networks; thus the host higher education institution is the most important source of support for international students (Cho & Yu, 2015). Host university support was found to have direct influences on international students' satisfaction on academic life and psychological well-being (Bai, 2016; Cho & Yu, 2015). The institutions' academic advisors and counseling services were found to buffer the effects of stress on psychological symptoms (Lee et al., 2004; Mallinckrodt & Leong, 1992).

Current Study

The current study examines how the international students' cultural intelligence and the amount of social support received may relate to their adjustment in a U.S. higher education institution. It is proposed that cultural intelligence may relate to adjustment as it incorporates the ability to effectively adapt to novel cultural contexts (Earley & Ang, 2003). It has been demonstrated as a powerful predictor for success in cross-cultural business (Earley & Ang, 2003). However, little research has extended the understanding of cultural intelligence in university settings (Harrison & Brower, 2011; Zhang & Goodson, 2011), yet social support has been emphasized in adjustment to college (Halamandaris & Power, 1999; Rahat, & Ilhan, 2016). The purpose of this research is to explore the direct and indirect effects of these two factors on the adaptation of international students as they transfer to international study (Zhang & Goodson, 2011). To the knowledge of the authors, only one study has examined direct and indirect effects of both cultural intelligence and social support on cross-cultural adaptation (Mao & Liu, 2016). The current study extended research and theory on personal and contextual factors on adjustment (Berry, 1992; Berry, 1997; Earley & Ang, 2003; Mesidor & Sly, 2016; Zhang & Goodson, 2011) by investigating the role of cultural intelligence and social support on international students' adjustment to further the understanding of how individual differences among international students influence transitioning to a U.S. university, and how the contextual factor influence the relationship between cultural intelligence and adjustment outcomes.

Research Questions

In order to extend the understanding of individual and contextual effects on international students' adjustment, this study investigated how both cultural intelligence and social support influenced international students' adjustment to a U.S. university in one model. With an interest in influences of social support from different sources, this study categorized social support into distant, local, and institutional.

Following the acculturation model, the current study extended the previous research by investigating relationships among international students' cultural intelligence, social support, and overall adjustment to U.S. higher education. The following research questions were addressed:

1. Are cultural intelligence and social support predictors of international students' adjustment to U.S. higher education?
2. Is there an interaction effect between cultural intelligence and social support on international students' adjustment to U.S. higher education?

Based on the acculturation model and previous research on international students' adjustment, hypotheses include:

1. International students' level of cultural intelligence, assessed by the cultural intelligence questionnaire, and level of social support experienced during their transition to an international academic environment, assessed as the amount of perceived social support from distant, local, and institutional sources, will account for statistically significant variance of international students' adjustment to U.S. higher education.
2. The relationship between international students' level of cultural intelligence and adjustment to study in an international institution will be moderated by the level of social support experienced during their transition to the institution. Higher levels of social support will strengthen the relation between international students' cultural intelligence and their adjustment.

Method

Participants

International students in this study were recruited from a large-size southwestern university. In 2017-2018, this university enrolled approximately 2,200 international students from 121 countries. Of these international students, approximately 850 were undergraduate and

1,350 were graduate students. More than 70% of the international students came from Asian countries, identifying these students as representing a majority of international students on this university campus. International students were defined as full-time students admitted by American academic institutions with an F-1 visa, following the United States Citizenship and Immigration Services (USCIS, 2017) definition.

After receiving approval by the University's institutional review board, an invitation email was distributed to all international students enrolled in the university through the university's International Office. In addition, student leaders of several international student organizations distributed invitation emails to their members. The invitation email included a description of the study and an online survey link to Qualtrics-based questionnaires. Participating students were compensated for their participation by being entered into a drawing for one of two $50 gift cards. To enter drawings, students provided their email addresses at a separate location, thus maintaining the confidentiality of students' responses.

A total of 351 students (approximately 16% of those potentially receiving invitation emails) responded to the survey. After excluding ineligible students (not an F-1 student or not finishing the whole survey), the final sample included 306 students (see Appendix Table 1). Participating students ranged in age from 17 to 47 years (M = 25.82, SD = 5.89). About 60% of the participants were graduate students. Over 70% of the participants came from Asian countries, 13% from Africa, 8% from Americas, 7% from Europe, and 1% from Oceania. The percentages of the sample's educational levels and origins were similar to the statistics of the international student population in the participating university, indicating a high level of representativeness.

Demographics

A demographic questionnaire asked students to report their gender, current age, country of origin, educational level, marital status, length of stay in the United States, and English language fluency. English fluency was assessed by participants' self-reported scores on three direct questions: "what is your present level of English fluency?", "how comfortable are you communicating in English?", and "how often do you communicate in English?".

Measures

Cultural intelligence. Cultural intelligence was measured using a 12-item questionnaire comprising of three dimensions of cultural intelligence: cognitive, behavioral, and emotional/motivational (Earley & Mosakowski, 2004). A sample item of cognitive dimension is, "when I come into a new cultural situation, I can immediately sense whether something is going well or something is wrong". A sample item of behavioral dimension is, "I can alter my expression when a cultural encounter requires it". A sample item of motivational dimension is, "I have confidence that I can deal well with people from a different culture". All the items are rated on a 5-point Likert scale (1= strongly disagree, 5= strongly agree). A higher total score of all the items indicated a higher cultural intelligence. The alpha coefficient for this scale was .78.

Social support. A direct measure of emotional and practical support developed assessed perceived emotional and practical social support from a variety of sources (Koeske & Koeske, 1989). In this assessment, students rated the amount of emotional and practical social support they received from 11 sources. These 11 sources included three distant supports sources from families, friends, or significant others (like partners) in their home country. Five local sources included families or relatives in the United States, friends in the United States who were international students from their home country, friends in the United States who were from countries other than their home country, American friends or classmates in the United States, and significant others in the United States who were not family but closer than friends (like partners). Three institutional social support resources included international students' academic advisor(s), the University's International Office, and other student services (e.g., school counseling). Students rated their level of support for each source using a Likert scale from 0 (none at all) to 4 (a great deal). If students did not have a type of source on the social network, they could indicate not applicable. Total scores for items from each source were computed to indicate the total amount of social support from each source. The alpha coefficients for home source, local source, and school source were .59, .51, and .77, respectively.

Dependent variable. Adjustment to university was the dependent variable and measured by the International Student Adjustment to College Scale (ISACS; Gómez et al., 2014). ISACS investigates international students' academic adjustment, social adjustment, emotional adjustment, and institutional attachment. ISACS is made up of 23 items on a 9-point Likert scale from "doesn't apply to me at all" to "applies very closely to me". Sample items are "I am satisfied with the extent to which I am participating in social activities in college" and "I am pleased now about my decision to attend this college in particular". A higher score indicates a better adjustment to university. ISACS in this study had an alpha coefficient of .89.

Results

Relation between Cultural Intelligence, Social Support, and Adjustment

SPSS software was employed to analyze data. Hypothesis 1 was supported with cultural intelligence, social support from family, non-family, and institution showing statistically significant positive correlations with international students' adjustment score ($r_{\text{cultural intelligence}} = .14$, $r_{\text{home}} = .12$, $r_{\text{local}} = .14$, $r_{\text{institution}} = .27$; see Appendix Table 2).

Hierarchical Multiple Regression Analyses

Hierarchical multiple regression analyses were performed to examine Hypothesis 2 examining the moderating role of cultural intelligence in the relationship between levels of social support and international students' adjustment. Analyses are presented on Appendix Table 3, *Hierarchical Multiple Regression Analyses Predicting Adjustment to University*.

In the first step, students' cultural intelligence scores and the amounts of social support from different sources were added to the multiple regression model to test Hypothesis 1. Cultural intelligence and all social support accounted for a significant amount of variance in international students' adjustment score ($R^2 = .10$, $p = .000$). Based on standardized coefficients, cultural intelligence was a significant predictor of the adjustment score ($\beta = .15$, $p = .006$), meaning one standard deviation increase in cultural intelligence score was related to a .15 standard deviation increase in adjustment score. Among three social support sources, only the standardized coefficient of social support from the institution was significant ($\beta = .28$, $p = .000$), meaning that the adjustment score increased .28 standard deviation with one standard deviation increase in institutional social support score. The result supported the hypothesis of cultural intelligence's and institutional social support's roles on international students' adjustment. Participants with a higher cultural intelligence score or with a higher amount institutional social support were more likely to well adjust to the university. Participants' levels of social support from home country and local sources did not have a direct effect on the participants' adjustment.

To examine the interaction effect of cultural intelligence and social support, the products of cultural intelligence and each source of social support, as predictors, were added to the model in the second step. After adding the products, the increment of accounted variance of the adjustment score by the overall model was not significant ($\Delta R^2 = .01$, $p = .300$), indicating no interactional effect between cultural intelligence and social support on adjustment to the university. The result did not support the second hypothesis that social support moderated the effect of cultural intelligence on international students' adjustment to the university.

Discussion

The aim of this study was to investigate the relationship between cultural intelligence, social support, and international students' adjustment in the United States. The findings provided evidence for the direct effects of cultural intelligence and institutional social support on the adjustment among international students in the university. Unexpectedly, however, based on the results, no direct effects of social support from families, friends, and partners was found to influence participants' adjustment. There was no interaction effect between cultural intelligence and social support on the adjustment outcomes.

The existing studies on the relationship between cultural intelligence and international students' adjustment to academic institutions were limited, but many of associations indicated cultural intelligence was a positive predictor of international students' psychological, cultural, and work adjustment (Chen et al., 2014; Lin et al., 2012). The result in this study was consistent with previous studies and strengthened the role of cultural intelligence in international students' adjustment. Regarding social support, social support from the university was a significant positive predictor of international students' adjustment to the university. This finding was consistent with some previous research that demonstrates the positive role of the academic institution support on a healthy adjustment among international students (Bai, 2016; Ye, 2006). It is suggested that academic institutions should take responsibilities in providing accessible services for international students, like counseling service in different languages and immigration advisors. Considering the positive role of cultural intelligence, academic institutions could provide cross-cultural workshops and events to help international students learn other cultures, improve willingness of participating in multicultural activities, and improve skills of successful interactions with people from various cultural backgrounds. Also, to establish supportive academic environments, academic institutions should increase the diversity of faculty members and organize activities involving both faculty and international students. It is important for academic advisors to understand the differences and needs of international students in order to assist them to achieve their academic goals.

Regarding social support from families, partners, and friends, the present study did not find they played a significant part in international students' adjustment. Previous studies demonstrated families, friends, and

partners are main sources of emotional and practical support for international students, but the relationship between social support from these sources and international students' adjustment is inconclusive (Baba & Hosoda, 2014; Cemalcilar et al., 2005; Hendrickson et al., 2011). More studies are needed to explore how social support from families, partners, and friends influences international students' adjusting outcomes. The future findings will extend the understanding of international students' needs of social support and benefit international students' success.

The second hypothesis was not supported by this study. Only one study in the existing literature identified social support as having an enhancing effect on the relationship between cultural intelligence and international students' adjustment to college (Mao & Liu, 2016). In the present study, social support sources were not found to have a significant moderating effect on adjustment. Considering the lack of studies on the role of contextual variables on the relationship between cultural intelligence and international students' adjustment, future studies on cultural intelligence could examine the moderation effects of social support from specific sources. Future findings might contribute to Berry's theory by providing evidence that advantages of contexts could change negative effects of individual characteristics.

Conclusion

Consistent with the hypotheses, this study found a significant relation between cultural intelligence and adjustment among international students. Among all sources of social support, only official university support showed a significantly positive effect on international students' adjustment to U.S. higher education. This study contributed to the existing literature on international students' adjusting experience by investigating the relationships between cultural intelligence, social support, and adjustment to the U.S. campus, even if results did not provide strong evidence for determining how social support influenced the relationship between cultural intelligence and international students' adjustment. Future studies are needed to explore individual and contextual factors in international students' experience.

A few limitations should be noted for generalizing the results. First, the data was collected in only one university with a low response rate, limiting representation of international students' experiences in other academic institutions. Academic institutions are like smaller society settled within a bigger one (Bai, 2016). Academic institutional cultures and practices in serving international students might vary across different universities. The results of the participants in the academic institution in this study might not be representative of international students' experience in other academic institutions.

Secondly, the accuracy of self-reported English fluency was unknown even though this method had been used in several studies (Yeh & Inose, 2003). Future studies may employ more professional and exact methods to assess the language variable (like TOEFL score). Moreover, all the questions were in English. International students perceiving low language skills were probably less likely to participate in the survey. The average level of English proficiency of the participants was high with the self-rating scale. Culturally sensitive scales with different language should be used to increase the possibility of recruiting more diverse students.

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Appendix

Table 1
Demographics (n=306)

		n	*Mean*	*SD*
Gender	Female	169		
	Male	137		
Educational level	Graduate	178		
	Undergraduate	128		
Marital status	Single	237		
	Married	64		
	Divorced	5		
Region of origin	Asia	218		
	Africa	40		
	Americas	26		
	Europe	20		
	Oceania	2		
Age (years)		306	25.8	5.89
Length of stay (months)		306	35.36	30.39
English proficiency		306	12.12	2.33

Table 2
Correlations Among Demographic Variables, CQ, Social Support, and Adjustment (n = 306)

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	--											
2. Age	-.05	--										
3. Educational level	.04	.52**	--									
4. Marital status	.09	.62**	.31**	--								
5. Length of stay	-.02	.32**	-.05	.20*	--							
6. English proficiency	.06	-.05	-.12*	-.02	.04	--						
7. Asian/non-Asian	.10	-.05	-.20**	-.01	.07	.39**	--					
8. CQ	.01	-.10	-.21**	-.05	-.06	.30**	.19**	--				
9. SS home	.10	-.00	.04	.13*	.02	.19**	.06	.08	--			
10. SS local	-.02	.04	.04	.07	.02	.02	-.09	.04	.43**	--		
11. SS institution	-.07	-.00	.08	.02	-.14*	.03	-.17**	-.05	.30**	.54**	--	
12. Adjustment	.05	.01	.08	.05	-.11	.34**	.11	. 14*	.12*	.14*	.27**	--

Note. CQ = cultural intelligence; SS = social support.
* $p < .05$. ** $p < .01$.

Table 3

Hierarchical Multiple Regression Analyses Predicting Adjustment to University (n = 306)

	R^2	ΔR^2	*p*	Predictors	*b*	*β*	*p*
Step 1	.10		.000**	CQ	.75	.15	.006**
				SS from home	.47	.03	.580
				SS from local	-.21	-.03	.622
				SS from institution	2.53	.28	.000**
Step 2	.11	.01	.300	CQ X SS from home	-.08	-.28	.534
				CQ X SS from local	-.11	-.86	.135
				CQ X SS from institution	.14	.66	.155

Note. CQ = cultural intelligence; SS = social support. * $p < .05$. ** $p < .01$.