Improving International Students' Cultural Skills
through a School-Based Program

Yue Zhang, Ph.D.
Santa Clara University
Martha A. Garcia-Murillo, Ph.D.
Syracuse University

Abstract

This study evaluated an on-campus leadership and culture program that helps newly arrived international students with their cross-cultural adjustment. The international student participants completed an acculturation survey at both the beginning and the end of the program. We found that factors causing these international students to have stressful adjustment experiences included the new environment, perceptions of discrimination, worry about access to opportunities due to cultural differences, and feelings of discomfort with others. Many program participants experienced positive changes in their adjustment to the new environment. The results suggest, however, that not all international students would benefit from participating in the program. The findings provide important insights for on-campus programs that aim to facilitate international students' cross-cultural adjustment.

Keywords: international students, acculturative stress dimensions, program evaluation, university services for international students

A large number of students from other parts of the world travel to the United States to study. According to the Institute of International Education (IIE) Network, in the 2015-2016 academic year, the United States received the largest number of such students yet: a total of 1,043,839 international students enrolled that year in American colleges and universities (Institute of International Education [IIE] Network, 2016), a figure that represents an 84.8% increase over a decade ago.

The experience of coming to the United States to pursue an academic degree can be exciting for international students, who are often striving to fulfill personal and career goals. Earning a U.S. degree may win them a lucrative job, considering that the U.S. is recognized for high quality in global education rankings (Hazelkorn, 2015). These educational experiences are important to international students because they can provide opportunities to learn new things, interact with people from different backgrounds, and increase students' understanding of the world and cultural competence, which will better prepare them to be competitive in today's global economy (Soria & Troisi, 2013).

At the same time, American universities and colleges benefit greatly from recruiting international students, since they are valuable financial and intellectual capital, as well as an important component of U.S. universities' workforce (e.g., as international teaching and research

assistants) (Smith & Khawaja, 2011). These individuals also enrich American campuses with their diverse heritage and cultural perspectives, and thereby contribute to the development of multicultural awareness and appreciation for both local and other international students (Harrison, 2002).

Although international students' coming to the U.S. to study is appealing and beneficial to both themselves and American universities, their different backgrounds can make them likely to experience difficulties and challenges when adapting to a new country (Smith & Khawaja, 2011). It is not unusual for students coming from abroad to face language barriers and difficult adjustments and to feel inferior by comparison to other students, even discriminated against, while they are going through the cross-cultural adaptation process (Wan, 2001; Tochkov, Levine, & Sanaka, 2010; Yeh & Inose, 2003). U.S. faculty and administrators should be particularly concerned about students who come from cultures that that are significantly different from that of the U.S.; their academic and professional success can be affected, to a certain extent, by their ability to learn, understand, and operate in an American educational, professional, and social context that can have significantly different expectations than the contexts of their prior upbringing.

Considering the high influx of international students to American universities, scholars in higher education have called for universities to provide necessary service and program help to international students to facilitate their adaptation and success (Murphy, Hawkes, & Law, 2002). On-campus programs such as orientations, workshops, and counseling centers have worked to provide useful information, activities, and services for international students to prepare them for living and studying in the U.S. However, international students come from different cultural backgrounds, and consequently, have different needs as they confront diverse challenges, all of which may cause stressful experiences associated with cross-cultural adjustment (Sumer, Poyrzli, & Grahame, 2008; Yeh & Inose, 2003). Scholars have investigated international students' possible stressors due to cross-cultural adjustment through collecting qualitative and quantitative data from these students, but not yet reach to agreement. For example, European students may not consider English barrier a stress source in their life in the US while for some Asian students, this is a significant challenge that may cause acculturative stress. The inconsistency in reporting international students' acculturative stress experiences may pose challenges to university programs trying to facilitate their transition period by helping them deal with stress experiences due to cross-cultural adjustment. Furthermore, few studies have evaluated the performance of university programs that aiming at reducing international students' concerns and adjustment problems. Whether they are effective in supporting these students' successful transition is not yet well understood. Based on this consideration, the purpose of this study is to determine if a carefully crafted leadership and culture program can reduce cross-cultural adjustment stress and help international students both perform better and feel better about their experience living and studying in the U.S.

Literature Review

Acculturative Stress

People from different cultural backgrounds who come to a new culture for a long-term stay (e.g., immigration to another country) have to undergo many adaptations and changes, such as learning a new language and acquiring familiarity with the social norms needed to fit into the environment (Wei et al., 2007). The changes that these individuals have to make can pose excessive psychological demands, which can cause a unique type of distress called *acculturative stress* (Allen, Amason, & Holmes, 1998). Acculturative stress has emerged as an important type of stress among international students, and it has been found to be linked to serious mental illnesses, such as anxiety and depression (Parr & Bradley, 1992; Sakurako, 2000).

Much of the academic research about international students' cross-cultural adjustment has used Berry's acculturation model (2005) to understand students' acculturative stress. Berry's (2005) model suggests that cross-cultural adaptation is a process of psychological and behavioral changes in life that result from a meeting of cultures. The psychological changes pertain to one's modified beliefs, perceptions, and attitudes, while the behavioral changes relate to external behavior toward those typical of the mainstream or host society. In this study, we focus on the psychological dimension, specifically on individuals' perceptions of stress due to cross-cultural adaptation (e.g., their perception of unfamiliarity with social cultural customs) (Lee, Koeske, & Sales, 2004; Castillo et al., 2007). In the adaptation process, the more an individual fits with the new culture, the less likely it is for him or her to perceive these changes as difficulties. If, on the contrary, the demands for change are perceived as an overwhelming challenge, stressed individuals may perceive the experience of living in a new society negatively (Wu, Garza, & Guzman, 2015).

Many international students have in common challenges involving language difficulties, financial problems, adjustments to a new educational system, homesickness, adjustments to social customs and norms, and, for some, racial discrimination (Smith & Khawaja, 2011). However, whether and to what extent they perceive these issues as acculturative stress vary from person to person. Wu et al., who investigated international students' challenges and adjustment issues in U.S. universities, found that Chinese students report stressful experiences arising from uncomfortable social interactions or language barriers (Wu, Garza, & Guzman, 2015). Similarly, a study of Korean students found that their stressful experiences stemmed mainly from social isolation and marginalization (Lee, Koeske, & Sales, 2004). Compared to Asian students, European students in the U.S. reported having an easier time interacting with Americans and, thus, they had fewer problems with social interactions (Trice, 2004; Lee & Rice, 2007). This may happen because European countries and the U.S. share some cultural attributes. In this respect, Kim and Sherman (2007) found that European and U.S. cultures both value self-disclosure, emotional support, and responsiveness in conversation. McWhirter and Darcy (2003) found that the adaptation of Asian students into American society was negatively affected by their tendency to be less open and their greater desire to display resilience compared to their European counterparts. These findings demonstrate that international students' experiences of acculturative stress differ from culture to culture.

Dimensions of Acculturative Stress

Studies among the population of short-term (e.g., international students) and long-term (e.g., immigrants) cross-cultural residents have shown that acculturative stress is a multidimensional construct. It may include stress due to having moved to a different environment (Caplan, 2007), a perception of discrimination, encounters with rejection, homesickness (e.g., regarding family, home, friends, or food), the burden of family obligations, and worries about opportunity deprivation (Zhang & Goodson, 2011). Table 1 below, presents the different dimensions of acculturative stress. It shows that researchers have not come to a consensus on the underlying dimensions of acculturative stress. However, common dimensions appear to be stress due to: (1) social interaction (Abouguendia & Noels, 2001; Caplan, 2007; Joiner & Walker, 2002), which is often affiliated with language barriers and perceptions of discrimination (Caplan, 2007; Fuertes & Westbrook, 1996; Kim-Bae, 1999; Lay & Nguyen, 1998; Sandhu & Asrabadi, 1994), (2) homesickness (Yu et al., 2014; Kim-Bae, 1999; Sandhu & Asrabadi, 1994), and (3) financial anxieties (Abouguendia & Noels, 2001; Caplan, 2007).

Table 1

Dimensions associated with acculturative stress

Study	Dimensions	Sample
Yu, Chen, Li, Liu, Jacques-Tiura & Yan, 2014	Rejection, Identity threat, Opportunity deprivation, Self-confidence, Value conflict, Cultural competence, and Homesickness	International students in China
Caplan, 2007	Instrumental/Environmental (e.g. financial, language barriers, lack of access to health care, unemployment); Social/Interpersonal (e.g. loss of social networks, loss of social status, family conflict); Societal (e.g. discrimination/stigma, legal status, political forces)	Latino immigrants
Fuertes & Westbrook, 1996	Environmental (e.g. subtle or overt acts of racism), attitudinal (e.g. difficulties stemming from being distant from families, friends, or heritage culture), family factors (e.g. conflicts with the families' values or expectations)	Hispanic college students
Sodowsky & Lai, 1997	Cultural competence	Asian immigrants
Joiner & Walker, 2002	Social, attributional, familial and environmental acculturative stress	African American university students
Abouguendia & Noels, 2001	General (e.g. lack of money), family (e.g. overburdened with traditional family duties and obligations), ingroup (e.g. People from my ethnic group not understanding my use of our native language) and outgroup (e.g. My fluency in English being underestimated by people from other ethnic groups) hassle.	University students in Canada who were immigrants (born outside of Canada, excluding refugees and international students) and children of immigrants born in Canada

Kim-Bae, 1999	Homesickness/longing for people and customs of homeland, language-related difficulties in the home and school, discrimination-related events, intergenerational conflict; in-out group peer stress	Vietnamese-American adolescents
Lay & Nguyen, 1998	In-group and out-group hassles	Female university students who were Vietnamese immigrants to Canada
Sandhu & Asrabadi, 1994	Perceived discrimination, homesickness, fear, guilt, perceived hatred, and stress due to change (cultural shock)	International students

The researchers listed above have primarily examined dimensions of acculturative stress among immigrants (Caplan, 2007; Sodowsky & Lai, 1997), minority college students (Fuertes & Westbrook, 1996; Joiner & Walker, 2002), and international students living in countries other than the U.S. (Abouguendia & Noels, 2001; Lay & Nguye, 1998). For example, a study by Yu et al. (2014), which examined European international students' cross-cultural adjustment in Chinese universities, found that for these students, acculturative stress can be deconstructed into seven dimensions: rejection, identity threat, opportunity deprivation, low self-confidence, value conflict, cultural competence, and homesickness. However, limited research has been conducted to explore the underlying dimension of acculturative stress among international students in the U.S. Ye's (2005) work appears to be one of few studies that have systematically investigated these dimensions. Ye examined East Asian international students from a large, southeastern U.S. university and found five dimensions of acculturative stress: fearfulness, perceived discrimination, perceived hatred, homesickness, and culture shock. While the population is slightly different, compared to other populations, as shown in Table 1, the type of challenges, international students experience in the US, overlap with those of other sojourning populations. The importance of focusing on the stressor that affect international students is because, at this early in their lives and with opportunities that a US education can affords them, failing to address these challenges can have a vicious circle where their inability to adequately cope, can further undermine their confidence and leave them highly vulnerable not only to fail academically but also to instances of depression or worse.

University Programs for International Students

Given the evidence we have about the stressful experiences that many international students have, some universities have implemented programs to facilitate these students' cross-cultural adjustment. On-campus programs of this sort can be categorized into individual-based and group-based programs. Individual-based services rely on one-on-one interactions, usually following a mentoring model, whereby a new international student is paired with a domestic student or an experienced international student (Thomson & Esses, 2016). Thomson and Esses (2016) examined one of these peer-mentorship program at a large university in Eastern Canada, where the program paired up each participating international student with a Canadian student. The pairs met weekly throughout a semester and had the freedom to find activities they enjoyed together. The mentor-mentee pairs were encouraged to explore the campus and the local

community and to practice English for the benefit of the international student. The study interviewed the program participants and reported that participating new international students experienced positive changes in their sociocultural and psychological adaptation. However, although it appears that the program was helpful for the international students, it suffered from a lack of structure. It was difficult for the researchers to determine what activities were done and how the activities involving international students and their local mentor Canadian students may be helpful to facilitate international students' better cultural adjustment. This lack of structure made it difficult to provide recommendations or advice to other peer programs aiming to help international students.

Another type of school-based program is group-based initiatives, such as workshops or orientations. Some on-campus workshops designed for international students focus on common problems, such as their unfamiliarity with the new educational system. In this area, Chen and Ullen (2010) studied a workshop at the State University of New York at Albany, aimed at helping international students succeed academically by teaching them about the research process and plagiarism. Researchers interviewed the participants and found that those who participated in the training showed significant improvement in both of these areas. Another study (Behrens, 2009) evaluated the effectiveness of a workshop to help international students prepare for job interviews and work in the U.S. The workshop focused on communication strategies in the interview process. It also included practice with interview questions and answers, which provided participants with strategies for handling job interviews. The positive feedback demonstrated that the program had successfully satisfied the participants' needs in this area. However, while these workshops may be useful in assisting international students with their academic and working abilities in the new environment, they do not appear to address international students' cultural and psychological adjustment, which is also important to their success.

Besides workshops, universities commonly have orientations for international students to acquaint them with the campus and the community. These on-campus orientations are widely used to provide information regarding academic policies and requirements for both international students and non-international students. They might also provide information on course registration procedures and on the various majors, minors, and specialties provided by the colleges and academic departments. Other orientation programs make international students aware of the various resources that are available to them, such as financial aid, health care services, on-campus events, and international student organizations (Wu, Garza, & Guzman, 2015). In addition to these face-to-face orientations, some universities have used web-based portals to prepare international students to live in their new country even before they depart from their home country (Jeon-Huh, 2015; Murphy, Hawkes, & Law, 2002). These orientation programs provide useful information that can ease the adjustment to living and studying in the U.S. In this respect we were unable to find empirical research about the effectiveness of these types of intervention. However, we suspect that it is unlikely to effective to address these student's acculturation process. Over the course of only a few days at the beginning of a semester they receive information about academic expectations, general university as well as

visa requirements, health care insurance, and, if time permits, a bit about cultural adjustment. Although the orientation programs might be informative and potentially helpful to internationals to settle down in the new environment, the information provided is overwhelming and potentially causing even more stress..

On-campus orientation programs or workshops provide useful information regarding living and socialization in the U.S. They can help international students improve their language communication skills and address their concerns regarding the adjustment process (Eland, 2001). However, acculturative stress is multidimensional and varies from person to person, which poses challenges for any university trying to design programs to help international students cope with stress. In doing so, they need to take into account their participants' needs and differences. Because of the scarcity of findings on the effectiveness of school programs trying to facilitate international students' cross-cultural adjustment, more research is necessary. This study is, thus, trying to fill this gap by assessing the effectiveness of a Leadership and Culture Program at Syracuse University, whose objective is to help international students reduce stress and concerns due to cross-cultural living.

The Leadership and Culture Program

The Leadership and Culture Program, the focus of this research, is an orientation program comprised of ten face-to-face sessions that took place during the students' first fall semester. The program was free, and it bore no credits. The sessions took place every Friday from 2:00-5:00 pm. Friday was selected because it is a day of the week when few classes are scheduled, and we wanted to reach the greatest number of students. The decision to offer the class for free was not unprecedented, because a similar leadership program had been offered to students in the past in a similar format—three hours on Fridays for ten weeks.

The program was experiential, with activities to be done within and outside of the classroom. Group discussions, games, simulations, role-plays, and many other activities placed the students in typical situations where they would encounter or interact with locals and people from other countries. The activities included, for example, bringing program participants together with a class from a different demographic in order to improve their cultural understanding and holding receptions for them to practice their social networking skills with locals.

The main objectives of the program are: (1) to make students aware of the cultural differences between the U.S. and their own countries to ease uncertainty about academic, social, and professional expectations, (2) to help students develop skills through activities in and outside of the classroom to facilitate a smoother transition into American culture and the university setting, (3) to provide an opportunity for international students to develop rich personal relationships with American students and other international students, and (4) to both teach students leadership principles and tools for coping in multiple contexts and to help students apply these principles.

Each week, the students were asked first to complete a chapter of required reading (Garcia-Murillo, 2013), an online module, and an outside assignment. They reported the results

of their assignment in a personal online journal that only the faculty member could read and comment on. For example, the first module of the program was about building confidence. The students read the chapter in the book on this subject, which presented research from psychology and economics. It explained, for example, what confidence is, how it is manifested, and what one can do to build confidence. The assignment for this module was to ride an elevator and speak to the person inside. The reason the students were asked to do this on an elevator is that it limits the amount of interaction in the event that the conversation does not go well. It gave the students the opportunity to experiment with talking to strangers, something they will need to do when they are entering a new environment and know few, if any, people. The students reported these encounters in their weekly journal. The results were overwhelmingly positive, not only because the students did well in these short encounters, but also because they experimented with having similar conversations at the bus stop or in the bus itself on their rides home. They commented on the positive experiences they had had, despite having been afraid of initiating conversation. During the class meeting, the students discussed the skills they had learned from the readings, the online module, and their practice. They were organized into groups to discuss things that were unfamiliar to them, with the objective of making them comfortable, for example, with offering an opinion. They were asked to complete complex mazes to illustrate the notion of persistence when they were ready to give up. Every class ended with a reflection on the activities, challenges, and the things they had learned. For some sessions, alumni were invited to speak, to share their experiences and offer advice. The last session lasted an entire morning and culminated with a keynote speaker and a lunch.

The topics covered in the program were based on research about the challenges that international students face. When the Leadership and Culture program was originally designed, the modules included were based on research by Landrum (2010), who identified a series of skills students should have before entering the workplace. Specifically, he included abilities such work well with others, set priorities, and allocate time efficiently to meet deadlines and handle conflict maturely, etc. Because their research focused on American students, the program was expanded to include modules where international students would need additional training. It is for this reason that the focus of this research does not have a one to one correspondence with the acculturation challenges listed above, as the program had a lager scope. The topics included for the program are listed in Table 2, below.

Table 2
Topics Included in the Program

- Building confidence
- Managing time across cultures
- Communicating across cultures
- Managing conflicts
- Building social capital

- Cultivating cultural understanding
- Setting goals
- Working with others
- Becoming a leader
- Enhancing creativity.

Based on the objectives of the Leadership and Culture Program, we designed our study to evaluate its effectiveness at helping international students cope with acculturative stress experiences. The study was guided by the following research questions:

Research question 1: What are the major acculturative stress experiences that today's international students at our institution are facing?

Research question 2: Based on the dimensions of acculturative stress, did the Leadership and Culture Program help to reduce the participants' stressful feelings due to cross-cultural adjustment?

Methodology

Participants

An e-mail invitation was sent to all admitted international students during the late summer of 2015. All students holding an F-1 visa (a student visa) or a J-1 visa (a temporary educational exchange visitor visa) with an interest in the Leadership and Culture Program were eligible to join. The program was also advertised during the first week of the general international student orientation to recruit students. The study's purposes and instruments were approved by the Institutional Review Board (IRB) at XXX University. A total of 25 participants were enrolled in the program. However, nine participants were excluded from the analysis, because 80% of the data they were asked to contribute were missing in the final analysis. Thus, in the final sample, 16 participants in the treatment group were compared with 39 randomly selected international students in the control group.

The control and treatment groups completed survey measures at two times, a pre-test in September 2015 and a post-test in December 2015. The average age was 25.9 years for the treatment group and 24 years for the control group. In the treatment group, nine students (56%) were female and seven (44%) male; in the control group, 23 students (59%) were female and 16 (41%) male. In both the treatment group (N= 18) and the control group (N= 33), most of the students were from Asia (East Asia or South Asia). The remaining small percentage contained international students from Europe, the Middle East, and Africa. Regarding their field of study, control group students were mostly in computer science or engineering-related programs (N= 13), economics or business (N=11), or information management (N=6), with the remainder in other programs (N= 8). In the treatment group, thirteen students were in information management and two were enrolled in media studies, and the rest three students did not identify their field of study. The demographic information about the two groups is presented in Table 3.

Table 3

Demographic Statistics for the Control and Treatment Groups.

Variable	Control Group	Treatment Group
Age	23.9 (SD= 3.5)	25.9 (SD=5.0)
Gender		
Female	23(59%)	9 (56%)
Male	16(41%)	7 (44%)
Home country		

China	21	2
India	9	7
Taiwan	1	-
South Korea	1	-
Georgia	1	-
Czech Republic	1	-
Singapore	1	-
Columbia	1	-
Iran	2	-
Algeria	1	-
Indonesia	-	7
Tunisia	-	1
Germany	-	1
Haiti	-	1
Japan	-	2
Field of Study		
Accounting/Economics/Business related fields	11	-
Computer/Engineering	13	-
Medicine	1	-
Geography	1	-
Information Management	6	13
Design/Arts	2	-
Math	1	-
Nutrition science	1	-
International relations	1	-
Media studies	1	2

Measurements

Demographics. The study contained items asking for the participants' age, gender, home country, and current field of study. Based on their responses, science, technology, engineering, and mathematics were coded as STEM fields, and social science, business, and other majors were coded as non-STEM fields. Students were also asked to indicate the academic degree they were pursuing: a four-year college degree, a master's degree, a doctoral degree, or a professional degree.

Acculturative Stress. The measure of acculturative stress reflects international students' cross-cultural adjustment regarding the degree of difficulty that participants encounter in everyday social situations because of cultural differences. We chose Sandhu and Asrabadi's (1994) Acculturative Stress Scale for International Students (ASSIS) scale to measure participants' acculturative stress level because of its wide use among researchers studying international students and because of its high reliability and validity (Ye, 2005; Ye, 2006a). The original ASSIS consists of 36 items, measuring international students' perceived discrimination, homesickness, perceived hate/rejection, fear and stress due to change, guilt, and other non-specific concerns. We selected 13 items for this study, based on the purpose and design of the

topics in the Leadership and Culture Program (see Table 3 for the items included). Respondents
to the ASSIS rate their agreement or disagreement with each of the items on a five-point Likert
scale that ranges from one (strongly disagree) to five (strongly agree). A lower score represents a
lower level of perceived stress due to acculturation, indicating a better outcome of adjustment
and adaptation. The instrument was administered to both the control and treatment group
participants at the beginning (pre-test) and at the end of the program (post-test). The reported
Cronbach's alpha for the 13-item scale was 0.875 for pre-test and 0.879 for post-test, suggesting
a high degree of consistency for the scale.

Analysis

We first conducted an exploratory factor analysis (EFA) of the 13-item acculturative
stress scale to detect its underlying dimensions, with a Varimax rotation approach using SPSS
version 23.0. The dimensions of acculturative stress represent specific stress experiences due to
cross-cultural adjustment. We then labeled each dimension by its conceptual meaning.

To identify the impact of the Leadership and Culture Program on international students'
cross-cultural adjustment, we first regressed the pre-test scores of each dimension of
acculturative stress on its post-test score for the control and treatment groups. Then we compared
the regression lines across the two groups. We plotted the estimated regression line to depict the
two groups' scores on each dimension of acculturative stress, from pretest to posttest. It was
expected that for each dimension of acculturative stress, when the groups had the same values on
the pre-test scores, the treatment group would have lower acculturative stress scores on the
posttest. The comparisons of the two groups' posttest scores for each dimension of acculturative
stress were conducted through a series of independent t-tests.

Next, we followed up with a post hoc analysis to quantify the effect size of the mean
difference between the control and treatment groups, using Cohen's *d* value. We also conducted
a G*Power analysis to suggest sufficient sample sizes for the control and treatment groups, using
an alpha of 0.05 and a power of 0.8 (Faul et al., 2013), maintaining the same ratio of sample size
of control over treatment groups.

Results

The EFA of the 13 items of acculturative stress revealed four factors that account for
68.52% of the variance in acculturative stress. The number of factors was determined by Kaiser's
criterion of eigenvalues greater than 1.0 (Kaiser, 1960), a screen-plot test showing the number of
data points above the "break" (Costello & Osborne, 2005), and the theoretical meaning of factors
(Field, 2009). Items whose loading coefficients were less than 0.40 or which were double-loaded
were deleted (Stevens, 2002). Table 3 presents the factor loading for each dimension of
acculturative stress. As is shown, four constructs emerged as international students' most
significant stressful experiences due to cross-cultural adjustment: (1) adjustment to the new
environment, (2) perception of discrimination, (3) worry about opportunities due to cultural
differences, and (4) feelings of discomfort with others.. The factor *adjustment to a new
environment* contained six items with factor loadings ranging from .487 to .752. The second

factor, *perception of discrimination*, contained three items with factor loadings ranging from .738 to .870. The third factor, w*orry about opportunities due to cultural differences*, contained two items with factor loadings of .614 and .900. The last factor, *feelings of discomfort with others*, contained two items with factor loadings of .662 and .851. Table 4 lists the factor loadings for the EFA of the acculturative stress scale and the Cronbach value for each factor. Cronbach values indicate whether or not the items used to measure a specific acculturative stress dimension possess an acceptable (> .60) internal consistency (Cortina, 1993).

Table 4

Factor Loadings for Exploratory Factor Analysis of Acculturative Stress Subscales

| Items	Factor 1	Factor 2	Factor 3	Factor 4
1. I don't feel comfortable adjusting to new cultural values.	**.752**	.322	-.152	.240
2. I feel sad living in unfamiliar surroundings.	**.735**	.370	.058	.056
3. I feel guilty that I am living a different lifestyle here	**.709**	.209	.301	-.174
4. I don't feel a sense of belonging here.	**.590**	.590	.359	.370
5. I miss the people and country of my origin	**.570**	.570	.039	.161
6. I worry about my future for not being able to decide whether to stay here or to go back.	**.487**	.230	.302	.212
7. People show hatred toward me nonverbally.	.210	**.870**	.031	.020
8. Others are sarcastic toward my cultural values.	.323	**.795**	.200	.010
9. I feel angry that I am considered inferior here	.183	**.738**	.115	.186
10. Many opportunities are denied to me because of my cultural background.	.155	.060	**.900**	.043
11. I feel that my status in this society is low due to my cultural background.	.180	.456	**.614**	.373
12. I feel intimidated to participate in social activities.	.045	.202	.041	**.851**
13. I feel insecure here.	.462	-.091	.219	**.662**
Cronbach alpha value	.818	.805	.686	.600

Note. Factor 1 is Adjustment to new environment. Factor 2 is Perception of discrimination. Factor 3 is Worry about opportunity due to cultural differences. Factor 4 is Feeling of discomfort with others.

Group Comparisons. For factor one, a*djustment to a new environment*, the two regression lines representing the treatment and control groups intersect when *x* equals 2.19, indicating that

for students in both groups who reported pretest scores greater than 2.19, the treatment group has a lower acculturative stress score associated with adjustment to the new environment on the posttest.

Figure 1
The estimated regression line of the two groups' score on adjustment to new environment from pretest to posttest.
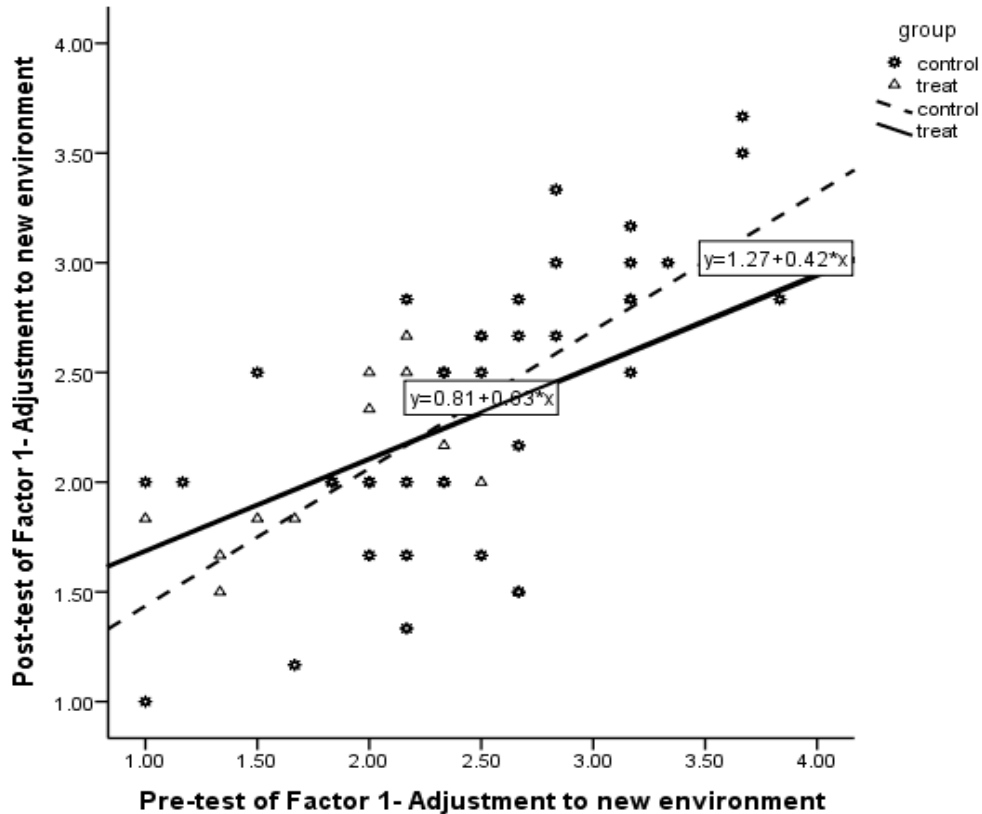
For factor two, *perception of discrimination*, the two regression lines representing the treatment and control groups intersect when *x* equals 1.62, indicating that for students in both groups who reported the same pretest score greater than 1.62, treatment group shows a lower acculturative stress score associated with perception of discrimination in posttest.

Figure 2

*The estimated regression line of the two groups' score on the perception of discrimination from
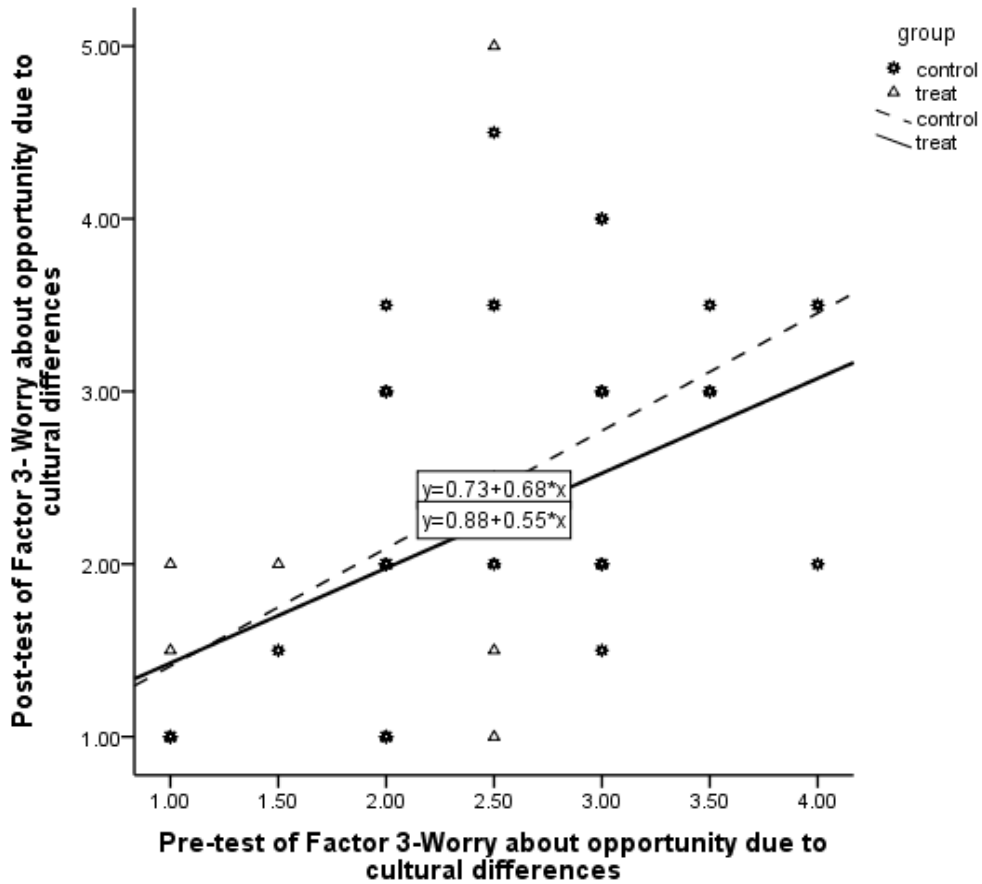pretest to posttest.*
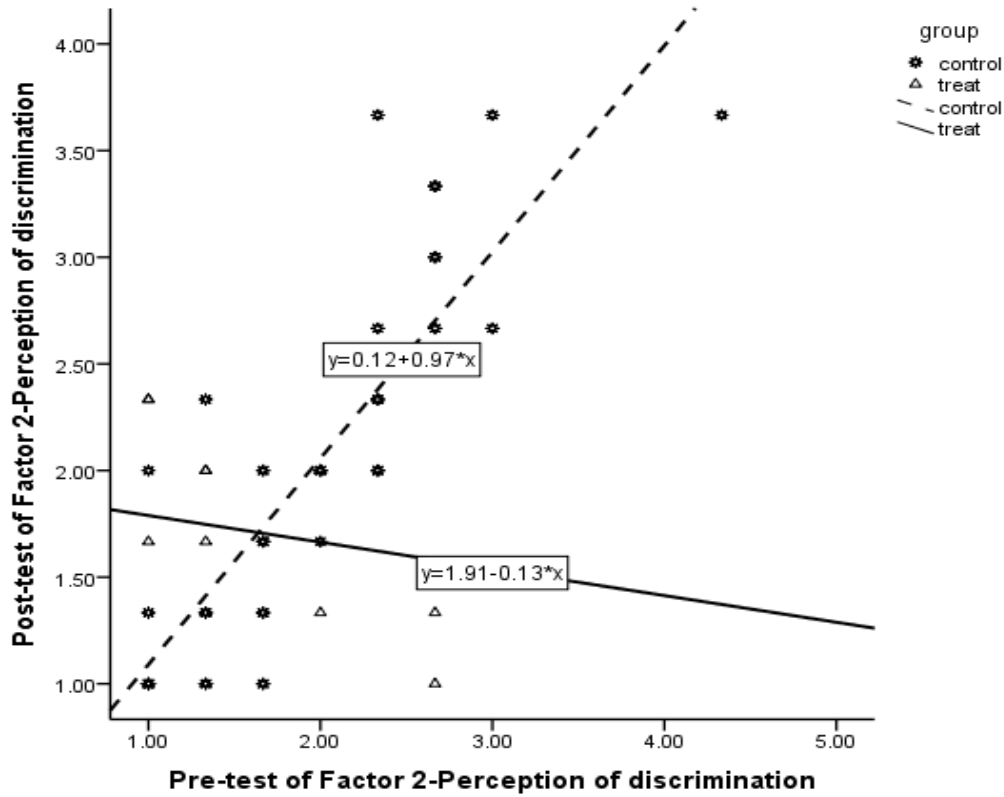
For Factor 3, w*orry about opportunities due to cultural differences,* the two regression
lines, representing treatment and control groups, intersect when x equals to 1.15, indicating that
for students in both groups who reported the same pretest score greater than 1.15, treatment
group shows a lower acculturative stress score in posttest, coming from worrying about
opportunities due to cultural differences. See Figure 3 below.

For Factor 4, f*eelings of discomfort with others*, the two regression lines, representing
treatment and control groups, had an intersection when x equals to 1.76, indicating that for
students in both groups who reported the same pretest score greater than 1.76, treatment group
shows a lower acculturative stress score due to feelings of discomfort with others in the posttest.

Figure 3

The estimated regression line of the two groups' score on opportunities due to cultural differences from pretest to posttest.

We then selected cases with pretest scores greater than the intersections and performed a series of independent t-tests to explore differences across the treatment and control groups in the posttest scores for each acculturative stress factor. Table 4 presented a summary of independent t-tests results for group differences in the posttest scores for each factor. As is shown, for factor one (*adjustment to a new environment*), the treatment group's posttest score was significantly lower than that of the control group (t (29)= 2.12, p <.05). For factor two (p*erception of discrimination*), factor three (*worry about opportunities due to cultural differences*), and factor four (*feelings of discomfort with others*), there were no significant differences between the treatment and control groups in the posttest scores for acculturative stress (see Table 4).

Figure 4

The estimated regression line of the two groups' score on feelings of discomfort with others from pretest to posttest.
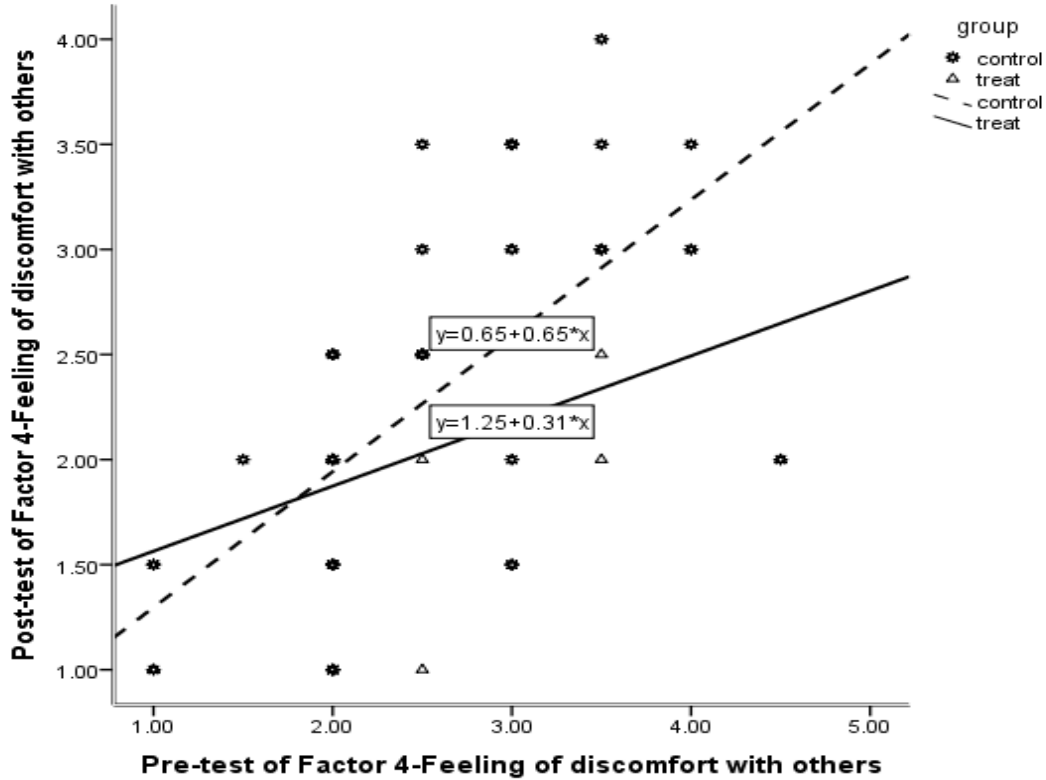

Table 4

Independent T test for each acculturative stress factor in posttest across control and treatment group

Factors	Group	N	Mean	t(*df*)	Cohen's d	Effect size
Factor 1. Adjustment to new environment	Control group	25	2.69	2.12(29)*	0.99	Large (>.8)
	Treatment group	6	2.19			
Factor 2. Perception of discrimination	Control group	35	2.09	1.01(45)	0.34	small to medium (0.2-0.5)
	Treatment group	12	1.83			
Factor 3. Worry about opportunities due to cultural differences	Control group	37	2.41	0.93(50)	0.29	small to medium (0.2-0.5)
	Treatment group	15	2.13			

Factor 4. Feeling of discomfort with others	Control group	34	2.41	0.52(43)	0.21	small (0.2)
	Treatment group	11	2.28			

Post Hoc Power Analysis. To test whether the non-significant results were due to a lack of statistical power, we conducted a post hoc power analyses using G*Power (Faul et al., 2013) with power $(1 - \beta)$ set at 0.80 and $\alpha = 05$, two-tailed. We also further determined the sample sizes needed for the treatment and control groups for an effect of this size to be detected (80% chance) as significant at the 5% level,. In the G*Power analysis, the study set the sample size ratio between the two groups to be equal to the ratio of samples in the actual study. The power analysis revealed that in order for the effect size (Cohen's $d = 0.34$) of factor two to be detected (80% chance) as significant at the 5% level, a control group sample of 221 and a treatment group sample of 75 would be required. For the effect size (Cohen's $d = 0.29$) of factor three to be detected (80% chance) as significant at the 5% level, a control group sample of 339 and a treatment group sample of 135 would be required. For the effect size (Cohen's $d = 0.21$) of factor four to be detected (80% chance) as significant at the 5% level, a control group sample of 709 and a treatment group sample of 227 would be required.

Discussion

The objective of the study was to evaluate the effectiveness of the Leadership and Culture Program at XXX University, which was designed to assist international students' cross-cultural adjustment and adaptation in the U.S. Based on prior research findings on international students' challenges and difficulties in the U.S., the program included topics like building confidence, cultural understanding, and communication, among others. To help newly arrived international students in the fall semester of 2015, the program assessed the participants' acculturative stress experiences and conducted a factor analysis to identify students' specific acculturative stress dimensions and adjust the topic coverage in the program. The activities in the program were designed to increase international students' cross-cultural understanding and to reduce uncomfortable feelings arising from their cross-cultural adjustment.

With regard to the first research question, we found four factors that caused stressful experiences for these students: (1) adjustment to a new environment, (2) perceptions of discrimination, (3) worry about opportunities due to cultural differences, and 4) feelings of discomfort in interacting with others. Among these factors, feelings of discomfort in interacting with others and perceptions of discrimination are consistent with prior studies examining underlying dimension of acculturative stress (Abouguendia & Noels, 2001; Caplan, 2007; Joiner & Walker, 2002; Fuertes & Westbrook, 1996; Kim-Bae, 1999; Lay & Nguyen, 1998; Sandhu & Asrabadi, 1994); however, these were conducted among immigrant population and populations of minority college students. There is a lack of research examining dimensions of acculturative stress among international students. This study contributes to the literature in this regard. Considering that a large proportion of international students in this study were Chinese students, we found dimensions similar to those found by Ye (2005) among East Asian international

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students, namely, fearfulness, perceived discrimination, perceived hatred, homesickness, and culture shock.

Based on the four identified acculturative stress factors, we evaluated the program's effectiveness at reducing students' stress feelings for each factor. For a certain group of international students, the Leadership and Culture Program reduced stressful experiences related to the adjustment to a new environment; however, we found that not all the participants benefited from attending the program. The program is more likely to benefit participants who report moderate to high stress levels on the acculturative stress scale than those who report no stress to moderate stress. To explain this discrepancy in the outcomes for these two group, we argue that the no/moderate stress group may have started their cross-cultural living in comfort, without realizing its potential challenges and difficulties, only to gradually recognize later that the adjustment to a new culture is not going to be as easy as what they may have expected. In contrast, the moderate/high stress group may have been aware that adjusting to a new environment was going to be difficult, so that they were looking for coping resources, such as participating in this program.

In terms of other acculturative stress factors, such as perceptions of discrimination, worry about opportunities due to cultural differences, and feelings of discomfort with others, the program showed a potential to reduce stressful experiences for a certain group of international students, although the treatment group did not show a significant decrease in these aspects compared to the control group. It is possible that these types of acculturative stress require longer-term interventions for international students to become psychologically comfortable with the environment and at ease in social interactions. It may take more than one semester's time to get over their discomfort. Although the program includes topics such as cultural understanding, communication across cultures, and working with others, participants may need more time to digest the information in the context of the reality of cross-cultural living. Another factor that may have contributed to the non-significant results may have been the limited sample size. Considering that there were only 16 participants in the treatment group and 39 in the control group, the analysis may not have had enough power to reach statistical significance. However, we provided a G*power analysis as a complementary analysis, which suggested sample sizes for recruiting participants for the treatment group and control group. A similar type of program may consider the suggested sample sizes, which would require significant efforts to recruit more participants particularly when the program is voluntary and they may either feel, correct or not, confident about their abilities or shy from it fearing additional stress from yet another responsibility.

Implications

Given that international students may experience various forms of psychological stress due to cross-cultural living, university programs should pay attention to students' acculturative stress experiences. Although the documented school-based programs have focused on helping international students improve their English competency (Sherry, Thomas, & Chui, 2010) and clarifying important academic and work issues in the U.S. (Chen & Ullen, 2010; Behrens, 2009), they are missing the crucial aspect of psychological adjustment. This study thus provides some

insights about the manner in which these students experience this acculturative stress and how they differ in the ways they overcome these challenges after being exposed to a program. Moreover, we identified, and then assessed, specific aspects of their acculturative stress experiences, with the aim of incorporating this information into the program design to better meet our international students' needs in the future.

The Leadership and Culture program used diverse activities (e.g., in-class and out-of-class activities and assignments) and various techniques (e.g., small group discussion, video and audio materials, etc.) to engage new international students and maximize the benefits. The Leadership and Culture program can benefit from further development to continue to address these specific challenges on a greater scale and then target those who are more vulnerable.

Limitations

Although we believe this study provides important insights into the effects that a semester-long program can have on new international students, we recognize that the study exhibits important limitations. First, the relative ineffectiveness of the program in reducing students' perception of discrimination, worry about opportunities due to cultural differences, and feelings of discomfort with others might be due to the limited sample size and, thus, the lack of statistical power. We conducted a G*power analysis and suggested sample sizes to maintain power to address this problem in the future. Second, given that the program was voluntary, the participants may not have represented the entire international student body, since only those who were interested in the program participated. In addition, the sample was not randomly selected; most of the students in the treatment group came from the graduate program of one of the authors. Therefore, a sample bias may exist and the results may not be generalizable to a larger international student population. Third, the program lasted only one semester, but cross-cultural adjustment may be a long-term process. Our study cannot tell whether the ineffectiveness of the program was due to its short duration, and the results might have been different if the program had been longer. Thus, there is room for further experimentation with interventions and program duration.

Conclusion

When international students come to the U.S. to study, the new academic, social, and cultural environments may require them to learn new skills to operate competently. Their unfamiliarity with these norms may cause them to feel stressed. At a time when education is experiencing increasing cultural diversity, it is crucial that our schools be ready to provide services to help international students better adjust and adapt to their new cultural environment. This study provides preliminary evidence that a ten-week leadership and culture program can have a positive impact on international students' adjustment and adaptation to studying and living in the U.S. While we believe that a semester-long program like this can be beneficial to international students, additional studies to understand, at a higher level of granularity, international students' acculturative stress responses to programs like this will be necessary.

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About the Authors

Yue Zhang is a Postdoc scholar in the Psychology Department at Santa Clara University. Her research focuses on adolescents' development, school functioning and environmental factors in association with children's outcomes. She also has research interest among international students.

Martha A. Garcia-Murillo is a Professor of Information Studies at Syracuse University. Her research expertise is about the impact of technology and public policy. She is also an expert in theory construction and has written and led workshops on the subject at multiple conferences and universities.