

A BETTER TOMORROW: EXAMINATION OF INTERNATIONAL STUDENTS'  
SUCCESS IN HIGHER EDUCATION

by  
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## DISSERTATION ABSTRACT

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Title: A Better Tomorrow: Examination of International Students' Success in Higher Education

International student enrollment in U.S. higher education has increased and diversified over the past decade. The unique needs and challenges international students face in pursuing higher education in the U.S. need a systematic investigation. Previous research literature has identified cultural diversity as one main challenge against international students' success. There needed to be a systematic approach in investigating the role of cultural values in predicting success of international students in higher education.

The present study applied Cultural Dimensions theory to the cross-cultural context of international student experience at the University of Oregon. It sought on one hand validation of the theory-based measurement model of cultural values in the abovementioned context. On the other hand, it explored predictive relations between patterns of cultural values based on the measurement model, and academic outcomes of international students at the institution.

Results of the study indicated that a Cultural Dimensions theory-based measurement model of cultural values had potential in further delineating the essential of

cultural diversity in the higher education. Multiple patterns of cultural dimension values found in the study indicated the uniqueness of cultural disposition within both and between international and domestic student population. Although no statistically significant relations were found between certain cultural dimension pattern and academic outcomes, future research could be conducted in refining the measurement model, mapping the patterns of cultural values within international student population, and track change of such patterns of individual students over time, and in relations to cross-cultural interaction.

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To all travellers who seek a better future through education

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# CHAPTER I

## INTRODUCTION

The purpose of this dissertation study is to identify the individual and institutional factors that influence international students' experiences in a U.S. higher education institution, and explore the paths to academic success of international students these factors constitute. Through this study, I attempt to describe the unique processes of development among international students in the U.S., specifically, at the University of Oregon, and to apply the results of the study to improve the institution's capacity of serving international students equitably.

### **Statement of the Problem**

Enrollment of international students in higher education institutions in the United States is on the rise for the eighth consecutive year. As of 2015, enrollment of international students in U.S. higher education institutions has increased by 130% from that of 2007. Meanwhile, Countries of origin and field of study of international students keep diversifying. Compared the 2014-2015 new enrollment to the year before, international student populations from the top 25 nations of origin have changed variedly: Students from one nation decreased as much as 6.4%, while students from another nation increased as much as 29.4%. In terms of the field of study, changes in new international enrollment varied from decreasing as much as 2.4 % to increasing as much as 23. 5% (*Open Doors Fast Facts 2015*, Institution of International Education).

The ever-changing trend of increasing international student enrollment has not only increased the demand of resources on the U.S. higher education institutions, but also challenged the framework of institutional support provided these students. As I will discuss later in more details, it has become obvious that the current institutional services, initially designed to meet the needs of domestic students, face new challenges to keep up with the unique needs of the ever-

changing population of international students (Korobova & Starobin, 2010; Kovton, 2010). International educators, higher education administrators and policy makers therefore seek research and application knowledge to address such challenges brought by increasing enrollment of international students in the United States.

University of Oregon (UO), a large public university that enrolls more than 3000 international students from various nations, is one such institution faced with abovementioned challenges and needs. As a doctoral student enrolled at the UO, I have a great opportunity of conducting a study to UO with the support of the institution and “reachable” population of study. In the rest of the proposal, I first present the literature review I completed recently, in which I demonstrated the inconsistency of the literature on factors that influence international student success in the U.S. higher education. Then I will discuss the implication of seeking alternative theoretical grounds, on which the dynamics of individual international students in interaction with the U.S. higher education institutions. Building on the implication drawn from the literature review, I will explain the theoretical framework I adopt from intercultural communication theories. Last, I will present my analysis plan of investigating the dynamics of intercultural communication as predictor of UO international student in achieving academic success.

## **Chapter II**

### **LITERATURE REVIEW**

In spite of the values of diversity and equity held by most public higher education institutions in the States, it has been noted by educators and researchers that international students often times face unique challenges, such as sense of isolation, academic struggle, difficulty in interaction with faculty and staff (Hsieh, 2007; Hunter, McCalla-Wriggins, & White, 2007). These challenges impedes their seeking of academic and lifelong success: adapting to unfamiliar pedagogy and instruction, identifying and gaining access to academic services, forging and reconstructing self-identity, achieving post-graduation success in or outside of the States , etc. These challenges reflect a more troublesome issue of inequity when international students usually bear the burden of twice to three times of tuitions and fees as much as those of their domestic counterparts (Guruz, 2011).

Many of those challenges have manifestations at UO. According to a recent report on UO international student academic performance (Ward & Jacobs, 2014), international students systematically performed worse academically when compared against their domestic counterparts. The report looked at the average GPA points for international freshmen and their domestic counterparts at UO in Fall 2011 and 2012, and found the gap of 0.1 and 0.07 each between international students and in-state domestic students in the same cohort, and that of their out-of-state domestic peers. Inequity between international students and domestic students at UO also manifested in the reverse bell curve that international students' grades formed in many first-year introductory courses. While domestic students' grades for these courses were distributed around a bell curve that indicated a normal distribution of inner aptitudes, 21 out of 25 first-year

courses in Fall 2011 and Fall 2012 had most international students graded on either low-achieving end, or high-achieving end, or both, which formed a reverse bell curve.

Therefore, it is of critical significance for a study that investigates the potential predictors of international student success at UO. To prepare for the proposed study, a comprehensive review on previous studies on international students and their experiences in US higher education would provide insight on how the study should be constructed.

### **Methods of Literature Search**

In completing the search for literature on success of international students in the U.S. higher education, I utilized two main databases: EBSCOhost and APA PsycNET. EBSCOhost, which comprises records from EBSCOhost ERIC, Education Abstracts, Professional Development Collection, is one of the most authoritative educational research database, and APA PsycNET has an extensive coverage for research articles featured by American Psychology Association. Both databases have long served educational researchers whose interest is in the junction of education and psychology, which is an important characteristic of the review.

In EBSCOhost, I set my search parameter to include all entries that had (a) “international students” in the title, (b) “universities” “colleges” “higher education” or “post-secondary education” in the title as well, (c) “academic” in the abstract, and (d) “American”, “USA”, “U.S.” or “United States” in the body of the article. As key subject of the literature on which this present review is focused, “international students” was expected to be in the titles of publications; “universities and colleges” further limited the context of the studies to the higher education; “academic” helped exclude administration-, logistics- and management-oriented studies regarding to higher education that might otherwise fell through the filtration; synonymies

of the United States in the body of the text helped narrow the range of articles to be relevant to the U.S. higher education.

Besides the search words, I also employed a limit on publication date to publications that appeared between 2000 and 2015. There have been noticeable shifts in both the number of international students and the demographics of those students in the U.S. higher education around 2000 (e.g., international student enrollment exponentially increased in US; Proportion of students from Asia noticeably increased); those demographic changes thus render little relevance of studies published before 2000 to the current state of research literature.

The initial search in EBSCOhost ERIC yielded 66 entries. After scanning through the articles, I excluded 32 entries based on the following criteria, the (a) population reported in the article was not international students in the United States; (b) article was not a research or evaluation report; (c) study was not an investigation of student success in higher education, but more a specific or technical aspect of student experience while attending colleges or universities in US (e.g., career development, library usage, language acquisition, etc.); and (d) entry was a duplicate of another record in the search result. The final yielded 34 articles to be included in the pool for the review.

In APA PsycNET, I initialized the search with parameters with the same essence but less specific as previously used in the EBSCOhost search to reach an exhaustive list of records, considering the disciplinary focus of APA PsycNET is psychology instead of education: “international students” in the title, “universities” in the abstract, and “academic” as well as “American” in the body of the text, and published between year 2000 to year 2015. The initial search yield 27 entries, including journal articles, book chapters and dissertation abstracts. Following a similar screening process as for the EBSCOhost search, I only excluded articles that

did not investigate student access in higher education, were neither research or evaluation reports, or failed to address the international students in US higher education as the targeted population, in addition to any duplicates or erroneous record whose publishing date was out of the predetermined time range. This screening process in APA PsycNET excluded 17 records, and kept 10 articles for the overall pool for review.

With final lists from both EBSCOhost and APA PsycNET combined, a total of 44 articles constituted the final pool for literature review. Such searching strategy ensured that the final pool of articles was exhaustive in presenting the current status of research on the success of international students in the U.S. higher education.

In the next section, I organize the review by the following aspects of those studies: (a) definition of or assumptions on concept of international student success, and (b) findings and implications. First, investigation on the fundamental assumption of what international student success entails in each study is critical in reviewing the state of the literature of interest. A systematic analysis of those assumptions across the studies will contextualize the knowledge on mechanisms of success for international students concluded in each study, and provide insights on the potentials and limitations of the current research-guiding theories. Second, results of analyses in the findings and implications sections will illustrate the current state of knowledge on the mechanism of success for international higher education students in the United States, while highlighting the gaps and missing elements of a comprehensive picture on this issue of interest. These gaps and missing elements will bring light to the direction of research and practice pertaining to the proposed study on predicting international student success at UO.

In summary, discussion of the previous research literature will provide implications to the following inquiry: What knowledge can the present study draw from the systematic review of the

literature pool, when supportive factors and challenges for international students are contextualized across study settings, and with respective definitions of “success”?

### **Summary of Review Results**

An analysis of the results in the reviewed studies yielded three observations. First, all studies identified some factors that were associated with positive or successful experience of international students in the U.S. Second, across studies, some factors were identified positively related to the positive or successful experience of students (e.g., adequate grades in college, satisfaction of students over their education experience), but other factors were negatively associated with negative experience (e.g., alienation, stress). I hereafter refer to the factors positively associated with international students’ positive or successful experience as “supportive factors”, and those negatively associated as “challenges”. In addition, some studies provided feasible institutional predictors of success that applies to the situation of international students. For the simplicity, such predictors were either “supportive factors” or “challenges” in accordance to their positive or negative correlation with the respective success criteria in these studies. Third, although no consensus exists in identifying supportive factors or challenges, one pair of supportive factor and challenge together emerged through the review as potentially influential to international student success, regardless of how success is defined.

**Success for international students in US higher education.** Appendix A summarized the criteria in each study, which defined or operationalized international student success in US higher education, as well as the quotations that most exemplified the respective criteria. After reviewing these criteria systematically, I observed three distinct orientations these criteria stem from: (a) domestic-centered normative orientation; (b) international-and-individual-centered orientation; and (c) international-and-institutional dynamic orientation. These three

orientations not only provided justification over the set of criteria each study defined its investigation by; more importantly, the distinction between those orientations foreshadowed the inconsistency of factors that enabled or challenged international student development in US colleges and universities.

The first orientation that formed the majority (18 out of 44) of those success criteria was domestic-normative orientation, which prioritized social or cultural assimilation, or in other words “when on campus, do as domestic students do.” Those criteria of success usually emerged in narrations that automatically assumed a deficit status for international students on US campuses, and took on norms of domestic students on US campuses as the standards that international students ought to abide by (e.g., Pham, 2013; Senyshyn, Warford, & Zhan, 2000). Embedded in those criteria of success in such orientation, phenomena portrayed as symptoms of such deficit status of maladjustment ranged from alienation, disengagement in campus activities (Weller, 2012), lacking interaction with American peers (Burkhardt & Bennett, 2015), limited English proficiency (Ota, 2013), unfamiliarity with American academic culture (Jeyabalasingam, 2015) etc. In those studies where success criteria followed a domestic-normative orientation defined the mission of inquiries to either explore the predictors of social, cultural or psychological maladjustment (e.g., Ota, 2013; Pham, 2013); or seek knowledge from international students to identify resources, programs or other institutional support that could potentially decrease the influences of maladjustment (e.g, Campbell, 2015).

Another orientation (13 out of 44) followed by some studies in the literature review was the international-individual orientation; where the narration of international student success was actively formed by international students themselves, with little expectation or assumption that these criteria should resonate with those validated or suggested primarily by US domestic

students (e.g., Sadykova, 2013, Wong, 2009; Wongpaiboon, 2009). In studies guided by the international-individual orientation, authority of knowledge was given to international students themselves, who then formed a concept of success, or arranged elements deemed to contribute to student success in their own way. Meanwhile, investigations in those references typically tried to tailor the institutional environment, organizational structure, and pedagogy to the student-identified needs for their success.

The last orientation exemplified in the reviewed studies (13 out of 44) in defining success of international students was the international-and-institutional dynamic orientation. Different from the two orientations discussed previously, the international-and-institutional dynamic orientation laid out an interactive context in which international student success criteria were formed: US higher education institution in this orientation was placed on an even-leveled field with international students, individually or as a group, where conflicts of expectations and paradoxical behaviors or observations signified such interaction (e.g., Curtin, Stewart, & Strove, 2013; Evvie, 2009) Such dynamic orientation fostered criteria of international student success that embodied both the fundamental values of US higher education, and the most critical element of success that international students embraced in seeking such education. Common criteria mentioned by studies in this orientation included academic success, which may be the proxies for program completion, retention, academic grades, or student-perceived academic success (e.g., Clauson-Sells, 2009; Fu, 2012; Haydon, 2004; Lee, 2011). Additionally, those references also sought to identify successful intersections between self-defined goals of international students and structuralized services and resources that the institutions are capable of providing.

In conclusion, the three orientations that guided the criteria of success utilized in the literature for international students in US higher education implied a philosophical

disagreements. With vastly different criteria of success, the literature on international student success had to be reviewed through the lenses of those orientations.

**Findings of supportive factors and challenges.** Appendix B summarizes all identified supportive factors and challenges in a matrix, with corresponding number of each study in which the factors was acknowledged. There were 17 supportive factors across the literature pool. The five factors identified in most studies were: (a) social network (17 studies) (b) relationship with faculty (14 studies) (c) dedication to/perceived value of quality education (9 studies) (d) staff support (8 studies) (e) solidarity (7 studies). There were 11 challenges identified in the studies. The top three challenges to international post-secondary student success in US in most studies were: cultural adaptation (23 studies); English communication (18 studies); and academic hardship (12 studies).

Among the 17 supportive factors, social network was included in more than a third (17 out of 44) of the studies. Kisang (2010) acknowledged not only the significance of adequate social networks such as family and friends back home in the transition period when international students first arrived at their respective campus. The study also identified other social networks (e.g., family relatives and friends in US, co-nationals on campus, and other international students), and their important roles in supporting the development of international students at a later stage.

Relationship with faculty was the second most recognized (14 out of 44) supportive factor across studies. Choi (2012) reported that international music students in the study attributed most influence over their academic success to good relationship with professors; Mamiseishvili (2012) reported meetings with academic advisors and interaction with faculty

were the statistically strongest predictors of first-to-second year persistence of international students at two-year institutions.

Among the 11 challenges that were identified that act against success, cultural adaptation was most prominent and was recognized in more than half (23 out of 44) of the reviewed studies. Urban (2012) found that international students identified negative experience of US majority culture as a source of disappointment. Burkhardt (2015) evaluated the cultural exchange programs on a university campus that meant to improve the cultural adaptation and diversity ended up creating more difficulty for international students to get over the cultural barrier and interact with domestic US students in a culturally comfortable way. English communication was the second most recognized challenge (18 out of 44). For example, Jeyabalasingam (2011) concluded that limited English proficiency imposed a difficulty for female Asian international students in fitting into their academic environment in US universities. Chavajay & Sknowronek (2008) found that international students did not feel comfortable communicating in English with classmates and instructors, and referred such uncomfortableness as a source of concern.

In addition to the acknowledgement in most studies individually, those two supportive factors and two challenges in pairs were also identified in the largest amount of studies. Social network as a supportive factor and cultural adaptation as a challenge was consistently identified in nine (9) studies, more than any other pair of supportive factor-challenge pair in the literature. The pairs identified in second most studies were relationship with faculty and cultural adaptation (7 studies), and social network-English communication (7 studies).

## **Conclusion**

The review of the literature of international students in the U.S. higher education, exemplified by the exhaustive pool of studies, yielded several major findings. Those findings

not only depict the current state of research in the experience and success of international higher education students in the U.S., but also help identify the gap in the literature pertaining to improving experience of and fostering academic success for this particular student population in the future generation of research and practice.

From the criteria of success for international students, to the findings of supportive factors for and challenges against their achievement of success, “lack of consistency” is a common theme that threads through every aspect of research or evaluation design in the literature. In terms of international student success as a concept, criteria for such concept varied in three different orientations. Most studies reviewed adhered to the domestic-normative orientation and assumed that international student success required international students to align their behaviors to the norms of American students on campus. Studies following the international-individual orientation or international-institutional orientation gave more authorities to international students and their subjectivity as action takers, where US higher education as an institution play a role in serving or negotiating with students to reach goals and purposes without dismissing their personal or cultural preference.

Along with the different orientations that define success differently, the findings in the literature on factors supporting or challenging international students in seeking success did not converge either. Yet regardless of the orientation in which success was defined in the studies, four supportive factors and challenges were acknowledged consistently. The contrast consistency between the orientation differences and the consistency in findings has further strengthened the validity of those factors. Such contrast also called for a theoretical framework that can adequately infer to the influence of those factors, as well as the dynamic relations amongst the factors themselves in the context of international students in US higher education.

Implications for future research in such field are thus two folds. On one hand, researchers can expand their understand success of international higher education students through an orientation that generates more relevance and meaning to international students themselves, and still give consideration to variable organizational characteristics in US higher education. On the other hand, researchers need to employ a theoretical foundation that could encompass the identified factors, i.e., social network, relationship with faculty, cultural adaptation, and English communication, in a dynamic context where international students actively interact with their environment in the US higher education.

## **Chapter III**

### **THEORETICAL FOUNDATION**

The review of research literature on international student success in U.S. higher education highlighted the need for an overarching theoretical foundation. Based on the foundation, main challenges identified in the literature are juxtaposed with main supportive factors and systematically explained. For this purpose, I searched in the broader social sciences with the main challenge of interest, i.e. cultural adaptation, and landed in the domain of intercultural communication. Cross-cultural communication theories are particularly situated in addressing the cultural transformation that international students in US identified as one of the main challenges. With a focus on interpersonal and intercultural effects and mechanisms of communication in its broadest sense, cross-cultural communication theories shed light on the seeming inconsistency among findings and knowledge regarding international higher education students in the US.

The foundation of cross-cultural communication literature was shaped by the practical need in post-World War II era. Human migration on a historically unprecedented level inspired scholars, researchers and practitioners to expand the frontier of human knowledge on the potentials and mechanisms, in and through which large populations of immigrants from other cultures adjust to and prosper in their host countries. Starting with a behaviorist root, crosscultural psychology later embraced more of a dynamic approach into culture as a construct under the influence of the ontological turn in psychology and social sciences. As a result, more recent development in cross-cultural communication has focused primarily on the interactive interpretation of the process of cross-cultural adjustment. Conceptual models and empirical research have consequentially looked into the measurement of such processes.

In the following section, I will briefly introduce three main theoretical models in cross-cultural communication, which bear relevance to the adjustment and transition process international students in the US higher education might experience. I will discuss the merits and limitations of each theoretical model in the context of my research questions, and elaborate on the one model upon which I choose to build my research study.

### **Ecocultural Model and Acculturation**

As one of the most dominant research paradigm in cross-cultural psychology, John Berry's ecocultural model of cultural adaptation gained acknowledgement and proliferation since early in the development of the literature in context (Spering, 2001). Ecocultural model disintegrates the cultural adaptation process of individuals living in a foreign culture into three levels: a) context, where ecological and sociopolitical variation count for the variance of cultural adaptation b) process, where the contextual ecological and sociopolitical variation is further transmitted through biological and cultural variation of individuals c) psychology, the outcome of variance on the previous levels (Berry, Poortinga, Segall, & Dasen, 1992; Georgas, Van De Vijver, & Berry, 2004)

Base on such theoretical model, Berry further proposed the acculturation strategies as a comprehensive description of individual cross-cultural adaptation (Berry, 1997). The overarching concept of acculturation, Berry emphasized, refers to subsequent changes induced in the original culture or cultures by people of different original cultures "come into continuous first-hand contact" (Redfield, Linton, & Herskovits, 1936, p149, as cited by Berry, 1997). The subsequent changes could be a) integration, when non-dominant cultural group values both keeping one's original characteristics or identity and maintaining relations with the larger society, and only when the dominant cultural group is open and inclusive in regards to cultural

diversity b) assimilation, when non-dominant cultural group value less of keeping their original characteristics and identity, but more of maintaining relations with the larger society c) separation, when non-dominant cultural group values keeping original characteristics and identity more than maintaining relations with the larger society d) marginalization, when nondominant group rejects both maintaining original characteristics/identity and maintaining relations with larger society.

Berry's ecocultural model and acculturation strategies present great potentials for a systematic investigation into cultural adaptations of individuals that experience acculturation in a multicultural society. When it comes to applying such model and strategies towards the phenomenon of international students in US higher education, several limitations render the theoretical framework inadequate.

First, international student experience does not necessarily fit in the description of assimilation, which limits the applicability of the theoretical framework consequently. Limited by legal requirements and conditions upon which they are allow to enter US, international students do not arrive on the campus without expecting to remain in the US society after their academic programs complete. Nor do they have a realistic expectation of keeping a continuous contact with a society much larger than their campus and neighboring community: in compliance with regulations to maintain their US visa status, a continuous enrollment at a full time level is required of all international students throughout their stay in the US. The demand of such academic commitment by itself practically blocks international students from having continuous first-hand contact with a larger society other than the campus population within proximity: faculty, staff, and peer students. Without necessarily experiencing acculturation, international

student experience might not be susceptible to the further nuanced acculturation strategies in Berry's framework.

Second, ecocultural model holds culture as a purely external influence factor, a stand-alone construct that casts influence on individual behaviors through transmission, with an ontogenetic perspective that renders individual behaviors or interpersonal interaction on a micro-level nothing but recipient of such influence (Ward, 2008). In the case of international students in US higher education, their primary purpose of learning and academic achievement for residing in US may motivate them towards a conscientious and unique position of inducing changes and seeking benefits and outcomes beyond acculturation and the promised psychological outcomes.

### **Constructivist and Transformative Cultural Adaptation**

Since the ontological turn in the field of psychology, the static and overarching construct of culture as an external outside force has been confronted both theoretically and empirically (Casrnr, 1999, Kim, 2005, Spring, 2001). The limitations of abovementioned post-positivist approach in explaining the variance of cultural adaptation behaviors of an individual across situations and over time, have inspired further development in cross-cultural communications to take a constructivist and transformative approach.

One prominent theory, the integrative theory of cross-cultural adaption, takes culture as a transformative process that entails changes in individual behaviors, values and identities (Kim, 1995). The integrative theory describes the adaptation process by way of individual encountering with both the host culture and the culture of their original identity. The interactive influence of the cultures on operational, affective, and cognitive level of human ecology, given time, will transform behaviors, values and identities of individuals, who will reach a certain level of functional fitness, psychological adjustment, and ultimately an intercultural identity. In other

words, the outcome of such transformative process can not be traced back to a simple intercultural encountering that can be measured quantitatively, to a qualitative change that occurs through interaction of nonconforming influences throughout the communicative environment.

Another promising theory that challenges the post-positivist notion of a static, quantitatively measured construct of culture in the field of cross-cultural adaptation is a third-culture building model. As exemplified by both Kim's integrative theory and third-building model, theoretical frameworks taking such transformative approach towards cross-cultural adaptation emphasize the critical role of consistent and meaningful intercultural contact. Integrative theory highlights time as the irreplaceable ingredient that allows for such cultural transformation; the third-culture building model makes critical claims of situations in which partners in cross-cultural communication establish continuous contact with purposes beyond need. Unfortunately, those critical enablers such as time duration and situations also impose great methodological limitations for empirical research studies: the adequate time duration and situations in which these constructivist and transformative cross-cultural adaptation should occur is either too greatly varied for any perimeter, or simply unknown.

### **Cultural Dimensions Theory**

The main theory is Geerts Hofstede's cultural dimensions theory (1984), in which he extracted the common factors of values held by people across cultures, and thus compared cultures on six scales: power distance (how much the less powerful members of an organization could accept that power distribution is not equal), individualism (how integrated individuals are into groups); uncertain avoidance (how intolerant individuals are towards uncertain situations); masculinity (how unequally the emotional roles are distributed among genders); long-term orientation (how much value individuals place on the future goals for which they need to adjust

their present practices and behaviors to achieve); indulgence vs. restraint (the degree to which members of a culture are allowed to display emotions) (Hofstede, 2013).

When applied to the international student experience in U.S. higher education, the Cultural Dimensions theory allowed international students' experience to be fully accounted without being reduced to the capacity of U.S. domestic students, and suggested a comprehensive mechanism through which international students cope with the challenges of living and learning in the U.S. colleges. In addition to the Cultural Dimensions theory, I have also found grounding for the proposed study through a more recent development in the intercultural communication theories: a third-culture building model (Casrnir, 1999). Criticizing the static dimensions cited as status quo by many researchers utilizing the Cultural Dimensions theory, the third culture building model scrutinized the changing process of cultural values and preferences of parties in a successful intercultural communication. In the context of my proposed study, the third-culture building model complemented the Cultural Dimensions theory with nuanced descriptions of the process that precedes in successful intercultural communications. The model suggests that established habits of contact, and emerging sense of mutual need, are essential precedence before a third culture emerges out of an intercultural communication (Casrnir, 1999; Conjé, 2011).

### **Implications for Research Design**

Scrutiny of the current research literature, and references of theories for mechanism of international student success in U.S. higher education, have resulted in several implications for designing my proposed study. In the framework of the Cultural Dimensions theory, in conjunction with the third-culture modification, my proposed study will be designed based on the following premises.

- ✓ Unique experience of international students in the U.S. higher education institutes can be better accounted for on a larger scale through Cultural Dimensions theory, where values deeply held in each of various cultures come in close proximity against cultural values normalized by domestic population on campus, and consequently influence international students' performances in US higher education institutions.
- ✓ The adjustment of international students can be described by the third-cultural building model, in which students gradually increase the consistence and meaningfulness of their interaction with the institution, till their cultural values are modified to dynamically match with normalized cultural values of the institution.
- ✓ The current literature highlighted orientation and individual-perspective and institutional perspective in the current literature.

Therefore, I designed the proposed study to address the following questions:

RQ 1. Does cultural dimensions theory adequately measure cultural values of international and domestic U.S. students at UO?

RQ 2. Do UO international students present various cultural values as predicted in cultural dimensions theory?

RQ 3. If unique patterns of cultural dimension values exist, do they uniquely predict academic success of UO international students?

RQ 4. If cultural value patterns exist, do cultural value patterns individual UO international students present change during the period after initial enrollment?

RQ 5. If change over initial period of enrollment is found, can interactions with various on-and off-campus cultural communities predict such change in patterns of cultural values?

## **Chapter IV**

### **METHOD**

In this chapter, I describe the (a) theoretical framework in which the research questions are formed, (b) design of the study that addresses each research question, (c) instrument through which data are collected, (d) variables that are included in the research design and how they are measured, (e) setting in which the study will be conducted, (f) participants in the study and procedures of recruitment, (g) instrument development through which I will improve the quality of the measurement protocol, (h) analyses I conducted to answer each research question.

To address the research questions, the study employed a non-experimental survey and correlational design. Those methods were selected to explore variances of cultural values among international students, and between international and domestic students at UO. Additionally, those methods helped predict their academic performance based on their cultural values. I conducted the study in the fall of 2016. The population of interest for the study was all degree-seeking international undergraduate students enrolled at UO during that term. More demographic description of the population is presented later in this chapter.

Qualified participants were invited through online (emails, social media posting, and flyers) and in-person (oral promotion) recruitment efforts. Participants were asked to give documented consent before participating in the study, which served as the cover page of the survey instrument after potential participants clicked on the survey link. The main task for participants was to respond to a survey instrument consisted of measurement items, as well as an item asking permission to access extant data on participants. The measurement instrument assessed participants on cultural value variables. The additional item could grant the study access to demographic and academic performance data collected by the UO for institutional operations.

Using those data on participants, I conducted the following analyses to address the research questions: factor analyses and latent class analyses.

### **Theoretical Framework**

Review of research literature on international student experience in US higher education indicated a great level of complexity, as most research in the area is idiosyncratic. Among the most identified challenges is cultural adaptation, a process of adapting to the culture of a foreign environment to function. Contrasted to the relative wide acknowledgement of this challenge was much limited description, let alone explanation of such process: theories of norm-referencing US domestic student experience, and analyses that use only standardized measures of academic performances, have greatly omitted the potential of cultural adaptation as a predictor of success for international students in US higher education.

To analyze cultural adaptation in the context of international student development, a theoretical framework is needed to describe the academic performance of individuals of various cultural origins in a given foreign environment. The framework needs to address the variance and complexity of how individuals of various cultural origins function in a foreign culture. The framework also needs to provide how or why certain individuals in certain cultural background often adapt more easily than others or other groups in a same foreign environment.

As discussed in Chapter II, Cultural Dimensions Theory specifies that cultures influence individual behaviors on six aspects: power distance, individualism, uncertainty avoidance, masculinity, long-term orientation, and indulgence vs. restraint. Values held in all cultures can be evaluated on these six dimensions on a spectrum, and those cultural values in turn explain the comparative advantages and disadvantages of certain groups over others in adapting to a foreign cultural environment (Hofstede, Hofstede, & Minkov, 2010).

Since the 1980s, many empirical studies have been developed to test or improve the Cultural Dimensions Theory. Yet it is worth noticing that most of those studies tested or applied the theories using data aggregated on a national or societal level. Such methods of empirical testing were based on two assumptions (a) national states are appropriate units through which cultures are manifest (b) cultural values within each nation-state are homogeneous in nature with no meaningful variance on the six dimensions in the theory. The best example of such studies was the IBM studies. In a series of studies over four decades, employees in multinational corporation International Business Machines responded to an instrument measuring their cultural beliefs and values related to working. The individual data were aggregated by employee nationality and evaluated on the dimensions proposed in the theory. These aggregated measures on cultural dimensions were then correlated to extant data on employee performances and other outcomes on which the corporate placed value on. The IBM studies not only statistically validated the constructs of the dimensions, but also confirmed the influence of cultural values over performances in a cross-cultural organizational setting (Hofstede, 1980).

Although the theory acknowledges the influence of culture over individual behaviors and practice, researchers are cautioned against directly applying the cultural dimensions theory to analyses on individual level: cultural values at a societal level are not the only source of influence on individual values and behaviors, thus analyses on individual level might not clearly present all six cultural dimensions. Despite such caution, previous researchers have investigated the usability of this theory in explaining individual differences in performance in cross-cultural settings (Hoppe, 1990). Those studies often found some but not all cultural dimensions at work at individual level, or found confounding variables that dissipated the unique contribution of cultural dimensions.

To test how much Cultural Dimensions Theory can explain international student success at UO, the proposed research study needs to analyze variance of student performance on individual level, while capturing variance of cultural values on group level. In other words, the study examines the following theoretical foundations:

1. Among UO international students, there are multiple sets of cultural values on (some of) the six dimensions in the theory at present.
2. Within a population of international students among which various sets of cultural dimensions values exist, an individual student's membership in a certain group culture is related to his or her academic performance at UO.

As cultural values influence individual behaviors and practices, individual experience and learning will also influence one's cultural values. The dynamic nature of cultural values is potent in understanding UO international student success, as the institution actively seeks exposure of multiple cultures on campus to all students as part of their educational experience (citation of UO policy). The potential cultural value change of individual students over a meaningful period of time posts additional requirements for the design of the study: the proposed study needs to account for any change during a meaningful period of time, before an adequate estimation of relations between sets of cultural values and academic outcomes is possible. Specifically, the proposed study needs to test following theoretical implications:

1. Cultural values of UO international students upon admission tend to change after attending UO for a period of time.
2. If so, the more UO international students interact with domestic and other international communities on and off campus during the period of time, the higher the probability is that the cultural dimension values of the students change.

The ultimate purpose of the study is to validate cultural adaptation process through cultural dimensions theory, and investigate the relations between cultural adaptation, or the lack thereof, and success as academic performance for UO international students. As result of the theoretical framework, the proposed study will therefore take a non-experimental design that examines unique patterns of cultural values naturally formed among participants in the lens of cultural dimensions, and correlates such patterns of cultural values with academic outcomes in order to test predictive relations between them.

### **Research Design**

As discussed previously, the purpose of the present study was to (a) validate the cultural dimensions theory in context of UO international students (b) explore the relation between cultural values and academic performance among UO international students, and (c) explore the potential transition of cultural values among international students, and its relations with quality of cross-cultural communications they have. Accordingly, RQ 1-2 addressed the measurement validation and unique patterns of cultural dimension values, and RQ3 addressed prediction of those patterns to academic outcomes.

In the original proposal, RQ4 and 5 were constructed to address potential transitions of cultural value patterns over time, and cross-cultural interaction as predictors of such transitions. Unfortunately, practical limitation lead to the removal of those two questions from the study design. When I recruited participants for the study in Fall 2016, the number of qualified participants for purposes of addressing RQ4 and 5 was insufficient (see Appendix C for rationale on the removal of RQ4 and 5). RQ4 and 5 were thus removed from the design of the study. I discussed the potential of those two research questions in Chapter VI, but for the rest of this chapter, and Chapter V, I only addressed the following research questions:

RQ 1. Does cultural dimensions theory adequately measure cultural values of international and domestic U.S. students at UO?

RQ 2. Do UO international students present various cultural values as predicted in cultural dimensions theory?

RQ 3. If unique patterns of cultural dimension values exist, do they uniquely predict academic success of UO international students?

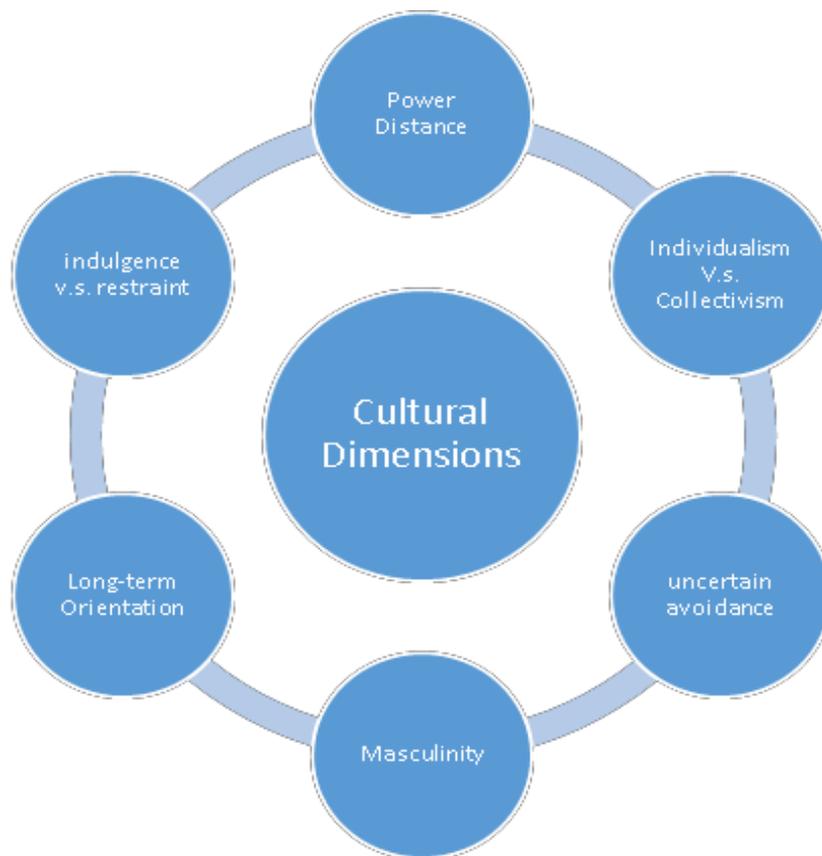
Overall, I employed a non-experimental design to conduct a series of correlational studies to address each research question. The design was chosen based on the following two conditions: (a) the nature of the inquiry, i.e., the mechanism of success of international students at UO, does not allow manipulation of any independent variables the study is intended to observe or analyze; and (b) the relations that the four research questions tackle are correlational in nature, i.e., the relations each research question is concerned with can be measured quantitatively in the variance and covariance of variables. For the rest of the section, I reviewed the part of literature and theoretical framework in relevance to each research question, and described the nuances of the design for each research question in relevance to the theoretical framework.

**RQ1.** In line with the theoretical framework I have adopted for this study, individuals from different cultural societies often hold different cultural values due to heredity. It is, of course, possible that individual cultural values could be influenced with other factors on individual level and fail to behave accordingly to all dimensions of cultural values. Particularly when it applies to a limited group of individuals across cultures in a shared environment, alteration, diminution, and combination of cultural dimensions present within that specific population is expected. These elements of the theoretical framework specifically pertains to the

design to RQ1, where cultural values of the UO international student population will likely embody some, but not necessarily all dimensions suggested in the original theory.

To answer RQ1, I first analyzed the correlations between the latent construct of each cultural dimension and the measures of cultural values UO international students present, as suggested in the theoretical framework. Through this process I tested the reliability of the six-dimension model in the context of my research study. Figure 1 presents the conceptual map for the six-dimension model that I will test in addressing RQ1.

Figure 1  
*Six Cultural Dimension Model for RQ1*



In the event that a null hypothesis of six-dimension model is not rejected, the study would need to explore the possibility of various cultural values on fewer or confounded dimensions. I would then employ another analysis to extract a number of factors (dimensions) out of the empirical data for the study that reflects some but not all cultural dimensions. In other words, the design to address RQ1 would then be to reject a null hypothesis that cultural value measures of UO international students are purely random and void of any cultural dimensions.

**RQ2.** Once the number and structure of cultural dimension factors were established for the study data, I continued in investigating the potential unique patterns of cultural dimension values. As discussed in the theoretical framework, differences in cultural values on national level have been validated through empirical studies, and are yet to be tested on group or individual level. Therefore, the study modeled covariance between observed variables after establishing a priori heterogeneity within the study sample. The assumption of heterogeneity entailed multiple vectors of structures between variables. In other words, RQ2 tested whether multiple data structures were present among the data of international participants, against a null hypothesis of homogeneity in this sample data. If the null hypothesis was rejected, it would mean that multiple patterns of cultural dimensions existed among UO international students.

**RQ 3.** Compared to RQ2 which tested the Cultural Dimensions Theory by applying it to UO international students, RQ3 sought external validation of the proposed theoretical framework. Once and again in previous research studies, cultural adaptation was identified as one of the main challenges for international students to achieve success, academically and otherwise. The theoretical framework adapted from the Cultural Dimensions Theory also associated difference of cultural values with variance in performance in a cross-cultural communicative setting (See IBM studies). To answer RQ3, a correlational design was employed

to test the relations between unique patterns of cultural values individual UO international students presented, and their academic outcomes. The null hypothesis was thus: relations between cultural value groups students fall in and their academic outcomes were random. If this null hypothesis was rejected, it would mean that patterns of cultural values presented by participants predicted their academic outcomes. See Figure 2 for the conceptual illustration.

Figure 2  
*Prediction of Academic Outcomes on Cultural Dimensions Pattern*



### **Instrument**

The primary instrument of data collection was an online survey protocol to which I recruited participants to respond. The survey instrument was designed to (a) measure cultural dimension values that measured patterns of cultural dimensions participants presented, and (b) request permission to access extant data on outcome and controlling variables included in the study. In the following section, I described the sections of the protocol as they related to the variables. The protocol was in two sections: (a) 24-items that measure cultural dimension values, and (b) one item that obtain participant permission to access extant data on outcome and controlling variables. Appendix D contains the survey protocol administered to all participants.

**Instrument development.** Section 1 was based on Hofstede's Values Survey Module 2013 (VSM 2013), an instrument that has been used in many studies to measure cultural

dimensions on national level with demonstrated validity and reliability measures (Hofstede & Minkov, 2013). I took the following steps to develop the survey instrument before opening it to administration. Through those steps, I further developed the survey protocol by improving its readability and accessibility as a measurement instrument. I also honed in on the accuracy and clarity of measurement items in alignment to the study's theoretical framework.

**Expert review.** I invited a panel of four experts to review my protocol, each with expertise in survey design, measurement, cultural adaptation and international student services, I solicited a structured feedback from each of them with a scoring rubric, and utilized the summative result as basis for further revision. For each expert on the panel, I provided a package that contained a brief description of (a) my study (purpose of the study, theoretical framework, and participants) and (b) background of VSM and VSM items in the survey protocol (history of VSM, and the cultural dimension each item corresponds to). Additionally, I provided a copy of my survey protocol, and a rubric for them to independently rate the protocol on the following criteria: (a) clarity of each item: 0-very confusing, 1-confusing, 3- clear (b) relevance of each item to its corresponding construct: 0-irrelevant, 1-little relevant, 2-relevant (c) edits or suggestions on items that are rated poorly on either clarity or relevance.

After receiving feedback from all reviewers, I summarized ratings of all items, and revised items that have either 0 or 1 rating on either clarity or relevance from more than one reviewer. For each item as such, I either incorporated experts' suggestions on revision, if such suggestions were consistent from more than one reviewer. Alternatively, I followed up with the expert with the low rating to discuss revisions of the item, if written suggestions were unavailable or inconsistent. Appendix E presents a scoring rubric sample used in the review.

**Pilot test.** To further strengthen the quality of the survey instrument, I invited a group of international students for a pilot test. I recruited these testers at a training session for a volunteering event organized by the OIA before Fall 2016. International students at this training were familiar with international student community at UO, and motivated to support this community with their volunteering work. Many of them were referred to the event, by former positions on international student leadership teams or advisory boards in various academic and student affair units at UO, whose insights and knowledge of international student experience have already been recognized by UO faculty and staff. The test had 10 total participants.

During the pilot test, I first introduced the purpose of the survey instrument and the present study, and asked the panelists to independently complete their survey from the perspective of their own unique experience and background. Added to the end of the survey instrument, I asked panelists to rate each item on the level of difficulty they had responding to it, and to explain the reason why they found an item difficult. Appendix F presents an example of such survey protocol with the feedback sheet used in the pilot test. After collecting all participants' feedback, I analyzed the items, to each of which more than two participants considered it difficult to respond, and revised them according to their feedback if available.

**Measurement items.** I modified the items in Module from item 1-24 in the original survey protocol by replacing phrases that refer to a work organization or work relations with their counterparts in a higher education environment like UO. For example, in the prompter before the first question, the original survey protocol started with "please think of an ideal job", the section in the proposed survey protocol writes "please think of a college or university environment that you consider ideal"; the original item No.2 read "have a boss (direct supervisor) you can respect", and the modified item No. 2 reads "have an advisor or mentor you

respect. Other revisions included changing direction of the scale for clarity. Item 23 was originally worded as double negative (“multiple directions... should be avoided”), but was revised to avoid confusion (“should... from single source”).

With modifications limited to context-specific wording, section 1 was expected to obtain the measurement quality equivalent to the original VSM protocol. As provided in *Values Survey Module 2013 Manual* (Hofstede and Minkov, 2013), Table 1 presents items and the variable of cultural dimension values they measure.

Table 1  
*Cultural Dimensions and Corresponding Cultural Value Variable Items*

Cultural Dimension	Cultural Value Variable Item
Power Distance	2, 7, 20, 23
Individualism	1, 4, 6, 9
Uncertainty Avoidance	15, 18, 21, 24
Long-Term Orientation	13, 14, 19, 22
Masculinity	3, 5, 8, 10
Indulgence vs. Restraint	11, 12, 16, 17

Section 2 of the protocol contained one item to obtain the institutional records of international students. The item requests participant consent on granting access to the following extant data at the University Registrar: (a) age (b) nationality (c) GPA at High school or equivalent secondary education upon admission (d) primary source of funding (e) Most recent term GPA and cumulative GPA at UO. Respondents can choose between “Yes” as giving consent to my request, and “No” as declining to provide such data. Under my request, UO office of Enrollment and Management provided me data on participants upon receiving their consent as responses to the last item in the survey protocol (See Appendix G for the letter of support from UO Office of Enrollment and Management).

## Variables

Table 2 presents all variables and their operationalized definitions. All variables were categorized as either independent variables or dependent variables. Independent variables include (a) cultural dimension variables, i.e., power distance variables, individualism variables, uncertainty avoidance variables, long-term orientation variables, masculinity variables, and indulgence vs. restraint variables (b) controlling variables, i.e., sex, academic performance at admission, English as a foreign language proficiency level, primary funding source. Dependent variables include two measures of academic success of international students, i.e. retention/graduation status and academic performance. I will discuss each set of variables separately in the rest of the section, specifically in their theoretical justification and operationalization in measurement.

Table 2  
*Variables and Operationalized Definitions*

	Operationalized Definition	Scale Type
Power Distance	Level of Accepting power distance	Ordinal
Individualism	Level of integration into groups	Ordinal
Long-term Orientation	Level of prioritizing future rewards over past or present	Ordinal
Uncertainty Avoidance	Level of uncomfortableness in unstructured situation	Ordinal
Masculinity	Level of emotional roles distributed across genders	Ordinal
Indulgence vs. Restraint	Level of accepting desire-driven behaviors	Ordinal
English as Foreign Language proficiency test score	TOEFL or IELTS-converted TOEFL score	Continuous
Sex	Student sex as recorded at UO institutional records	Nominal
Primary Source of Funding	financially support participants to live and study full time in US	Nominal
Academic Performance at Admission	Secondary school cumulative grade point average	Continuous
Academic Performance at UO	Grade point average at UO	Continuous
Retention and Graduation Status	The expected status of progress through a UO undergraduate degree program: on track, or not on track	Nominal

**Independent variables.** Two kinds of independent variables were included in the present study, I discuss each in the order of relevance to research questions. First, variables of interest included six dimensions in Hofstede's Cultural Dimensions Theory (Hofstede, Hofstede, & Minkov, 2010). As discussed in the section of instrument, these variables have been used repeatedly in previous research in measuring the corresponding constructs proposed in the Cultural Dimensions Theory.

- Power distance (PD): the degree to which individuals in a lesser powerful position in a societal or organizational structure accept and expect the unequally distributed power in the society or organization.
- Individualism (IND): the level to which individuals in a culture are integrated in groups, and guide their own behaviors and values by needs, preferences and values of others whom they identify as in-group members.
- Uncertain avoidance (UA): the extent to which individuals in a certain culture feel uncomfortable and therefore try to avoid ambiguity and uncertainty in the future
- Long-term orientation (LTO): the extent to which individuals in a certain cultural background would orient their behaviors in accordance with future benefits instead of those in the past or present
- Masculinity (MAS): the extent to which individuals were tough, assertive, and focused on material success.
- Indulgence vs. Restraint (IVR): the degree to which a cultural society allows individual behaviors to be freely driven by basic human desires, such as seeking joy and fun.

Each of these cultural dimension variables were measured by a set of survey responses on 5-point Likert scales. See Appendix C *Survey Instrument* for anchors of those variables.

The other kind of variables was controlling variables. They were included in the study for their potentials in predicting cultural value patterns or academic outcomes, as discussed in the literature review. In the present study, these variables were (a) country of origin (1= domestic, 2= international) (b) English as a Foreign language proficiency test score at admission (i.e., TOEFL<sup>®</sup> ibt score, or equivalent scores converted from other English language learner proficiency tests; hereafter referred to as TOEFL). (c) sex (1= male, 2=female) (d) primary source of funding, i.e., the primary sponsor who provided financial support that enables international students to live and study full time at UO. This variable was coded in the following way: 1= self-supported or family supported, 2 = partly self-or-family supported, 3= supported by external funding agency (e.g., US government, government of home origin, endowment, etc.). (e) academic performance at admission (i.e., grade average point submitted for admission, hereafter referred to as HSGPA).

**Dependent variables.** Two dependent variables were in the present study: (a) academic performance at UO, operationalized as grade point average (GPA), and (b) retention and graduation status, a nominal variable that categorizes participants' overall progress towards earning their college degree. As discussed in the section of literature review, previous studies have consistently used these two variables as proxies of success for college students, including international students, as the two variables standardize academic outcome for participants regardless of their stage of college attainment, and they are much valued by either international students themselves, or the higher education institution, or both.

GPA is a composite score of grades over credited hours. It is calculated as follows:

$$\frac{\sum(\text{Grade Point Credit Hour} \times \text{Grade Point Value})}{\sum(\text{Grade Point Credit Hour})}$$

According to the UO Registrar (2016), Grade Point value for any course can be one of the following: .7, 1.0, 1.3, 1.7, 2.0, 2.3, 2.7, 3.0, 3.3, 3.7, 4.0, 4.3. Thus, for any UO undergraduate student, GPA variable could vary on a continuum between .7 and 4.3.

Retention/graduation status was another proxy of academic success in terms of progress towards achieving the degree. As discussed in the instrument section, extant data on retention and graduation status for each participant are two separate binary codes. In context of standardization, I recoded the raw data into one variable that categorizes participants' progress towards degree in order of desirability, without penalizing participants who just start against those who are closer to completion. Therefore, for anyone who were enrolled at UO for more than four years, the retention and graduation status variable was coded in ascending order of expectancy: 1= not graduated (retained, or dropped out); 2= graduated. For any participant who are enrolled at UO for three years or less, 1 = not retained and not graduated; 2= retained or graduated.

### **Setting**

The project was conducted at University of Oregon (UO), a public university on the Pacific coast of the United States. UO has full range of academic programs awarding bachelors, masters, doctorate and other professional degrees. It is also a member of American Association of Universities, one of the top 61 institutions in the US. Academic programs at UO award Bachelor's and Master's degrees, Post-bachelor's and Post-master's certificates, as well as doctoral degrees of research/scholarship, professional practices and others. There are eight colleges at UO, two of which are graduate colleges (School of Law and Graduate School). As of Fall 2016, a total of 20067 (84.9% of total) undergraduate students at UO are enrolled in 89

academic major programs across the colleges. College of Arts and Science has most (59.6%) of the total undergraduate enrollment across campus, seconded by College of Business (17.1%) (University of Oregon Office of Institutional Research, 2017).

The enrollment apportion of international students comes similarly. Table 3 compares enrollment characteristics of international students at UO to the overall student population in Fall 2016 (University of Oregon Office of Institutional Research, 2017). Like that of the overall student population, undergraduate students are the majority (85.6%) of international students enrolled at UO, and College of Arts and Sciences is the college with the largest (48.4%) international student enrollment across campus. College of Business has the second largest percentage (30.9%) of the total international undergraduate student enrollment at UO, but this college has the largest proportion (21.7%) of international students in its undergraduate enrollment among all colleges.

Table 3

*UO International and Overall Undergraduate Student Enrollment in Fall 2016*

	International (% , n)	Overall (% , n)
CAS	(48.4, 1246)	(50.8, 10201)
LCB	(30.9, 796)	(18.2, 3660)
JO	(5.8, 150)	(10.6, 2126)
AAA	(4.9, 127)	(5.64, 1234)
ED	(3.4, 87)	(5.0, 1013)
MUS	N.A.	(1.6, 312)
Undergraduate Students	(85.6, 2572)	(84.9, 20067)

N.A: number of students in this category was below the minimum for disclosure per institutional rules at UO.

**Participants**

The population of interest in the study was undergraduate international students attending UO. Operationally, it included any student enrolled in any bachelor’s degree program at UO who holds a valid F-1 visa or I-20 (degree-seeking enrollment form) issued by United States

Department of Homeland Security. That operational definition excluded any student of foreign origin who attended the UO for a fixed short period of time, for non-academic purposes, or are undocumented immigrants. In Fall 2016, a total of 2717 international students were qualified to participate in the study.

Table 4 presents the country of origin and major breakdown of these potential participants. Top countries of origin that in total account 91.4% of all UO international students were China (75.2%), Saudi Arabia (4.5%), Korea (3.3%), Japan (3.0%) and Taiwan (2.9%). Top majors that account for 50% of all international undergraduate students at UO were Pre-Business Administration (19.1%), Economics (16.5%), and Undeclared (10.3%). 44.1% of those students were female, and 55.9% were male. In terms of class standing, 24.3% of them were freshmen, 23.0% were sophomores, 24.0% were juniors, and 28.0% were seniors.

Table 4  
*Demographic Breakdowns of UO International Students (Fall 2016)*

Country of Origin % (n)		Undergraduate Major % (n)		Class Standing	Sex
China	75.2% (1933)	Pre-Business Administration	19.1% (490)	Freshmen	Female 44.1% (1135)
Saudi Arabia	4.5% (116)	Economics	16.5% (424)	24.3% (624)	
Korea	3.3% (85)	Undeclared	10.3% (265)	Sophomore	
Japan	3.0% (78)	Business Administration	7.0% (179)	23.0% (592)	
Taiwan	2.9% (74)	General Social Science	4.7% (121)	Junior	Male 55.9% (1437)
Indonesia	1.1%(28)	Computer & Information Science	4.4% (113)	24.0% (618)	
Canada	.7% (19)	Mathematics	3.9% (100)	Senior	
Hong Kong	.7% (19)	Psychology	3.2% (82)	28.0% (719)	

Additionally, a representative sample of 1000 domestic undergraduate students at UO was selected by the UO Office of Enrollment and Management, to serve as the pool of domestic participants. Table 5 represents the demographic breakdown of eligible domestic participants.

Table 5  
*Demographic Breakdowns of UO Domestic Students (Fall 2016)*

Ethnicity		College		Class Standing	Sex
White	56.8%	CAS	50.8%	Freshmen 21.4%	Female 45.7%
Hispanic or Latino	10.6%	LCB	13.1%	Sophomore 19.1%	
Asian	5.3%	JO	9.1%	Junior 19.2%	
Black or African American	1.9%	AAA	5.1%	Senior 24.0%	Male 37.8%
American Indian or Alaska Native	0.5%	ED	4.3%		
Native Hawaiian or Other Pacific Islander	0.4%	MUS	1.3%		

Recruiting qualified participants for the present study incorporated two main methods: online recruitment and in-person recruitment. Appendix H presents all recruiting material used for this study. For online recruitment, I secured support from ISSS in sending emails of invitations to all qualified participants, through their venue of electronical communication for operations (see Appendix I for letter of support from ISSS). On my request, an ISSS staff member built a list of emails of all qualified participants and send out those recruitment emails. In the email, I briefly explained the purpose of the study, voluntary nature of participation, tasks for participants, potential risks and benefits for participation. The email ended by inviting recipients to participate in the study by clicking on the link to the survey instrument, which first landed on the page of informed consent.

A week after sending the initial emails, follow-up emails were sent to non-responding qualified participants, which reminded them of the opportunity to participate in the study.

Another round of reminders were sent through emails a week after the first reminder emails, and followed by the last reminder emails a week after that. In addition to mass emails, ISSS staff who assisted me on implementing the survey instrument also posted links to the survey on the ISSS social network websites, such as Twitter and Facebook.

To complement the online recruitment managed through ISSS, I planned additional recruitment campaigns to seek participants of specific origins, in preservation of the proportionality of participants to the population. For each of the top five origins of which international students constitute about 80% of the total international student population at UO, i.e., China, Saudi Arabia, Korea, Japan, and Taiwan, I followed up with additional recruitment efforts that target participants of specific origin whose response rate is lagging in comparison to others. For example, I contacted student organizations at UO dedicated to serving specific international student populations, such as UO Chinese Student and Scholars Association (CSSA), Arab Student Union (ASU), and International Student Association (ISA). When given permission, I distributed flyers with brief information about the study on them, as well as links to the survey. Or I gave a brief promotion of the study orally at their member meetings. Some groups promoted the study at their own social media sites as well.

## **Analyses**

Hypotheses in the research design specified that (a) UO international students present among them different cultural dimension value patterns; (b) the particular cultural value pattern one presents predicts one's GPA and retention/graduation status. To capture different patterns of cultural values without establishing the differences a priori, analyses were conducted to identify

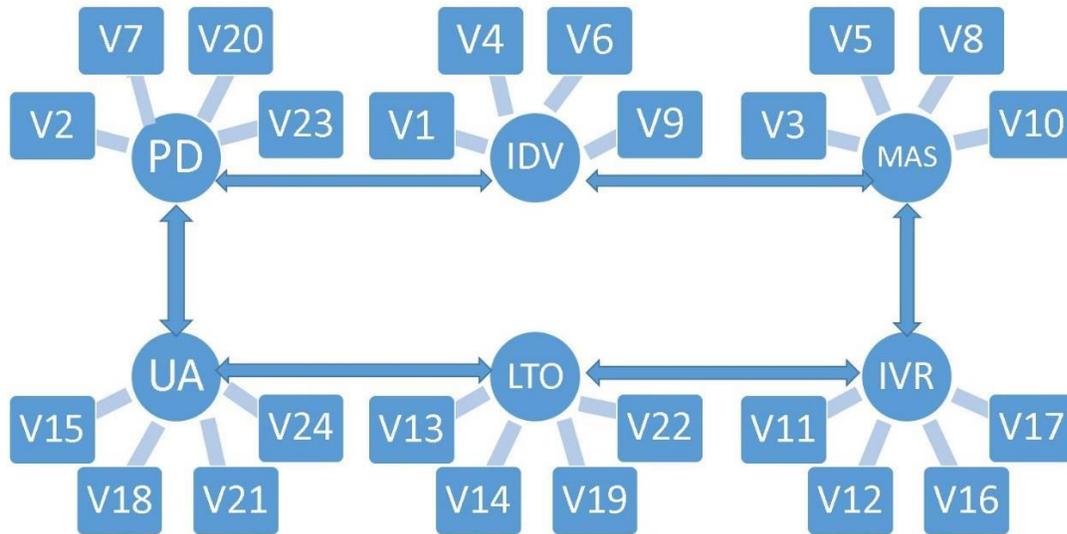
subgroups within a sample based on their measures of a set of variables without pre-assigned group identification. Statistical procedures like latent class analysis (LCA) were best suited for such estimations (Lazarsfeld & Henry, 1968).

In the rest of the section, I discuss analyses for each research question. First, I presented the statistical procedures in concept, through which I conducted each analysis. Then, I also established criteria by which I made decisions at the end of each analysis for the next in sequence. Last, I summarized results and concluded each research question, which provided foundations for the next chapter of further discussion.

**RQ1. Measurement instrument validation.** According to the research design that addresses RQ1 and 2, I conducted a series of structural equation modeling (SEM) procedures. The purpose of SEM procedures was to first confirm the existence of the latent construct, i.e., cultural values, and its measurement structure. According to the theoretical framework, six cultural dimension variables function together as the latent construct of cultural values. Thus through SEM procedures, six factors would emerge out of observed measures of the study participants, and factor loading of measurement items would confirm such measurement structure. Figure 3 presents the conceptual map of the hypothesis in SEM procedures. Under the assumption of SEM, V (Variables in rectangles) 1-24 corresponds with numbered items in the measurement instrument, and individual cultural dimension variables were presented as factors (displayed in circles). Each observed measure (variables 1-24) has an error of measure term (displayed in squares) associated with it. Each block arrows between an observed variable and a factor, and each double-headed connector between factors represent a parameter that the SEM procedure would estimate based on the sample data in the study.

Figure 3

*Conceptual Map for Confirmatory Factor Analysis for RQ1 in SEM*



I used IBM SPSS ®Amos Version 23 for these analyses for its complexity of estimations and visualization. SEM procedures would estimate (a) a factor loading for each variable and its corresponding factor and (b) model fit for the overall model. All estimations would be established at  $\alpha = .05$ . To confirm that the model fit the data adequately, I used the following criteria (Kline, 2011): for factor loading estimates, I would accept its value higher than .25 as an indicator of good fit, thus the latent factor will explain more than 50% of the variance of the indicator variables. For model fit, I would use RMSEA, CFI, and TLI. If RMSEA is not substantially higher than .05, CFI is not substantially lower than .9, and TLI is not substantially smaller than .7, I would accept the specified model as a good fit to the data. If all criteria were met, I would conclude that the Cultural Dimensions Theory measurement, as originally structured, applied adequately to the sample in the present study, and that the measurement model suited the purpose of the study. In the case of the model failing to meet the criteria, an exploratory factor analysis would be conducted to explore the number of factors the participant

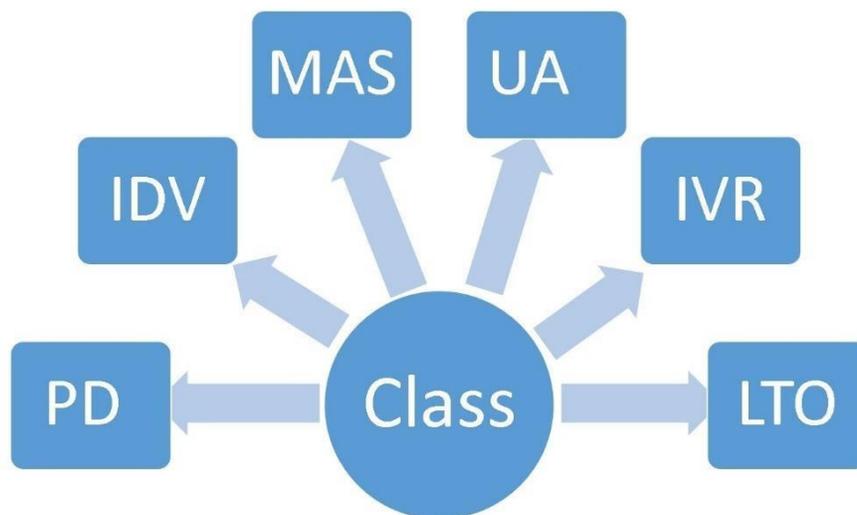
data presented, and how the variables loaded on the new set of factors. I then would repeat the SEM procedures to confirm if the model-data fit meets the previously discussed criteria.

**RQ2.** Figure 4 presents the conceptual map of the LCA analysis for RQ1. In line with the design for RQ1 that required establishing unique groups of cultural dimension values without prior assignment, I conducted a latent class analysis (LCA) using PROC LCA in SAS® version 9.4, with factor scores extracted from the confirmative factor analyses in previous procedures. Figure 4 presents the conceptual map of LCA. LCA assumed heterogeneity among study participants in how they responded to the measurement instrument, and based the observations on a common set of variables. According to the research design for RQ2, LCA analyses were uniquely advantageous in testing a hypothesis of an unknown number of unique patterns without establishing group membership a priori. To test a hypothesis in such context, LCA built a series of nested models and test the comparative fit of each model using incremental fit indices.

The procedures of LCA hypothesis testing were as follows: I first specified that two classes (unique pattern of cultural variables) existed among the data sample in the study (measures collected through the survey instrument), the minimum of a heterogeneous sample. Then I specified that number of classes to be three, and re-estimated the model. The program would produce estimates of a range of indices each time, which measured the fitting between the specified measurement structure and the variance/covariance matrix of the data sample. At each specification, indices such as Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were expected to be smaller than the one specified before. The smaller AIC and BIC measures would indicate that the newly specified model have a preferable fit with the data sample, even at the risk of harming parsimony more than the last model. Ultimately, the model that had the smallest AIC and BIC estimates was established to be the best fitting model to the

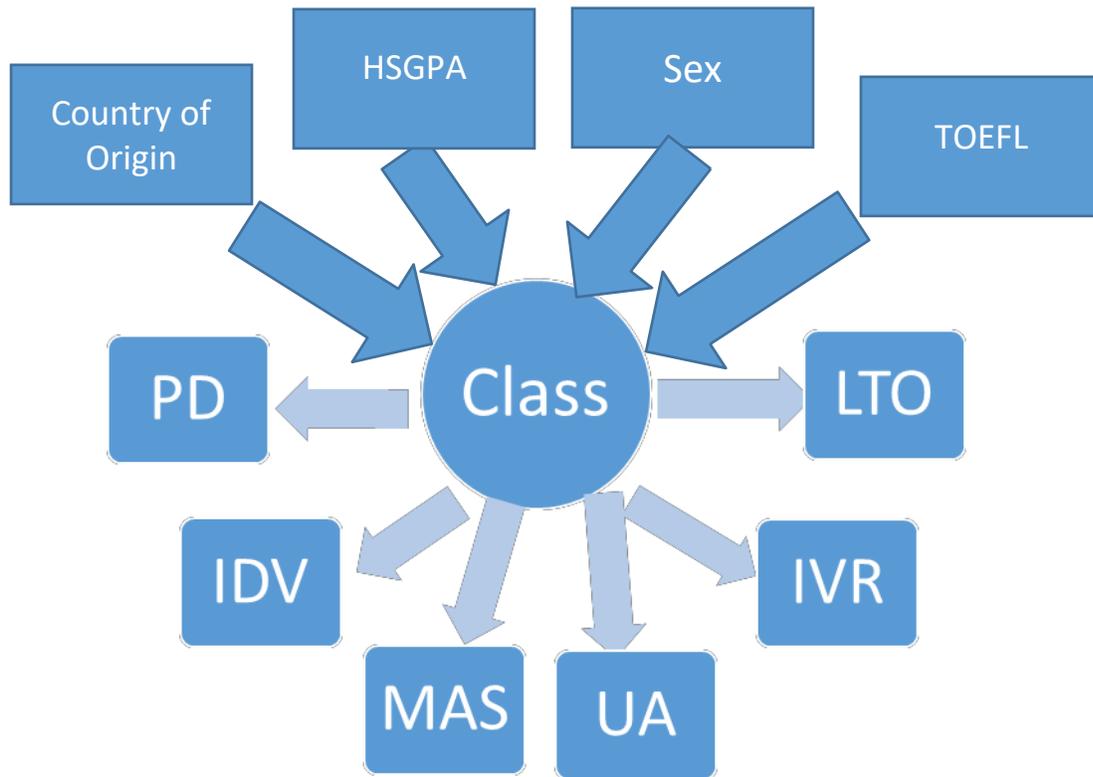
data. It was then selected as the base model, on which I built sequential analyses to test hypotheses related to RQ3. The best-fitting base latent class model, with more than one class of measures present, would also rejected the hypothesis for RQ1 and support that multiple unique patterns of cultural values were present in the data sample.

Figure 4  
*Conceptual Map of LCA*



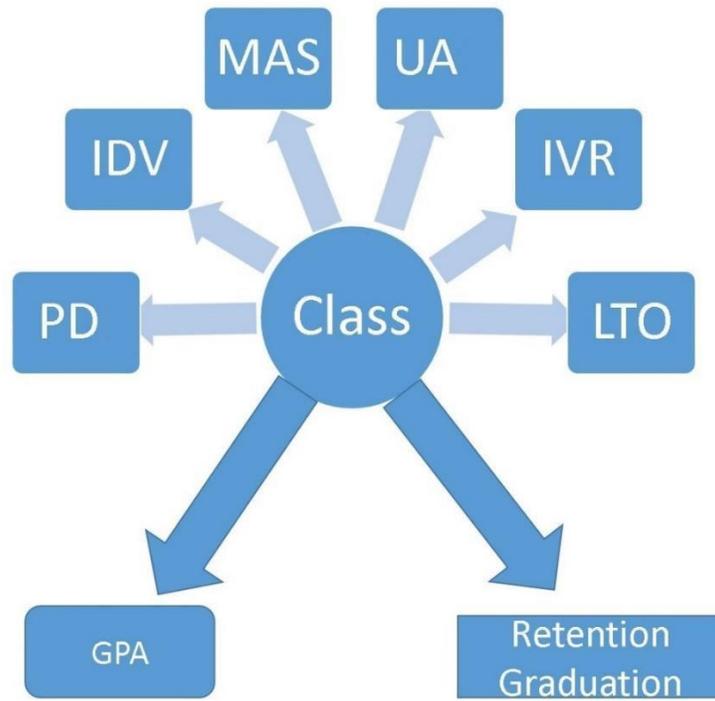
**RQ3.** In addressing RQ3, Figure 5 and 6 each present conceptual maps for LCA with covariates, and for LCA with distal outcomes. Once the base latent class model was established, I conducted a series of LCA with covariates based on the base model, to explore predictive relations between participants' demographic, financial, and academic preconditions, and their class membership of cultural values. Using the %LCA\_Distal Macro in PROC LCA, I conducted the covariate analyses with (a) sex (b) country of origin (c) primary funding source (d) HSGPA and (e) TOEFL score. The program would estimate the regression coefficient, and a probability at  $\alpha=.05$ . for each covariate. Based on these criteria, I would conclude on the relations between each covariate and the estimated class membership of individual participants.

Figure 5  
*Conceptual Map of LCA with Covariates*



Next, I conducted two LCA with distal outcomes, to explore predictive relations between participants' estimated class membership of cultural values, and their academic outcomes (retention/graduation status, and GPA). Using the %LCA\_Distal Macro in PROC LCA, I conducted the outcome analyses with (a) GPA as a continuous outcome variable, then (b) retention/graduation status as a categorical outcome. The program would estimate and report class size ( $N$ ) and means ( $M$ ) of each outcome variable, associated with different classes of cultural values. Based on these indices, I would calculate Cohen's  $d$  for between-group difference of outcomes (Lanza, Tan, & Bray, 2013). Specifically, effect size would be calculated as follows:  $d = \frac{|M_1 - M_2|}{SD}$ .  $M_1$  and  $M_2$  were means of outcomes assigned to two classes of participants, and  $SD$  was the standard deviation of the outcome variable for the whole sample.

Figure 6  
*Conceptual Map of LCA with Distal Outcomes*



## CHAPTER V

### RESULTS

In this chapter, I report the results of analyses conducted to address each research question in the study. First, I present results addressing RQ 1, which validates cultural dimensions theory a measurement framework, and establishes the optimal structural equation model as the base for future analyses. Second, I move to results addressing RQ2, which confirms the optimal latent class structure based on the base measurement model. Third, I summarize the results addressing RQ 3, including (a) latent class analyses with covariates and (b) latent class analyses with distal outcomes.

#### **RQ1. Measurement Instrument Validation: Does Cultural Dimensions Theory Adequately Measure Cultural Values of International and Domestic U.S. Students at UO?**

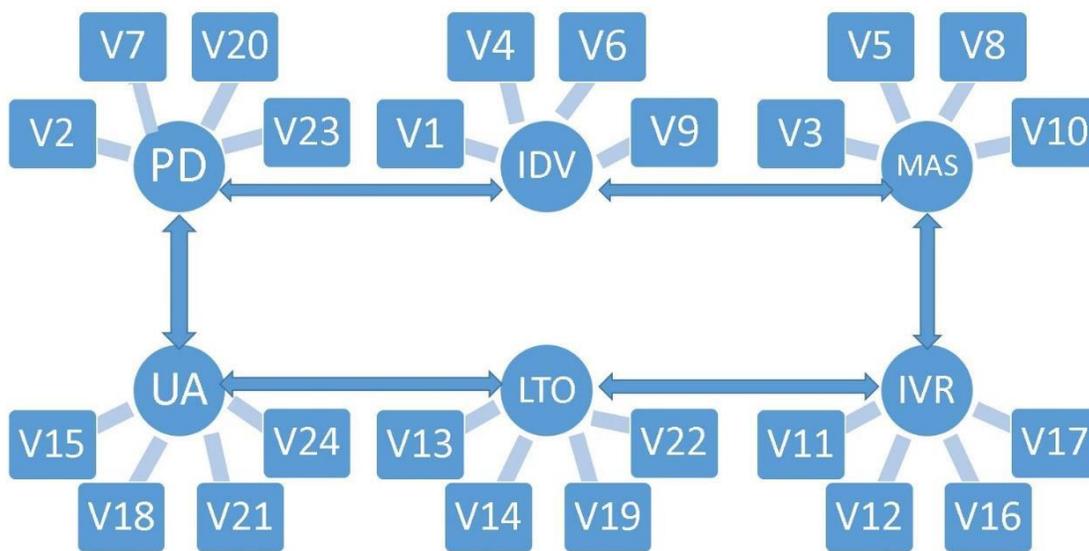
The first research question aimed at verifying a measurement model based on the framework of Cultural Dimensions Theory. The framework suggested that six cultural dimensions, measured each by four items in the instrument, would capture variances among individuals of different cultural values. That is, the total measures of all subjects in the sample demonstrated a common pattern of variance and covariance, as in the theoretical framework.

It follows that the purpose of this research question was to test whether the proposed model of measurement, with reasonable adjustment and specifications, adequately described data collected on the study sample. This measurement model, once validated, becomes the base for subsequent analyses addressing RQ2 and RQ3. The following narrative describes the results of the analyses specific to this question: results of factor analyses, both confirmatory and exploratory, and the validated structural equation model, which fits adequately both measurement design and data structure.

As an advance organizer, the results of measurement validation process rejected the original six-factor model hypothesized in the proposal, and confirmed a four-factor model as the measurement model to use in analyses for following research questions.

**Measurement model selection.** The original measurement framework of Cultural Dimensions Theory proposed a six-factor model, each measured by four items (see Figure 7 for the illustration of the original measurement model). Six factors in the model were PD, IND, UA, MAS, LTO and IVR. The four items measuring each of the factors were connected to the encircled factor. Chapter 3 had discussed in more details this original measurement model.

Figure 7  
*Conceptual Map for Confirmatory Factor Analysis for RQ1*

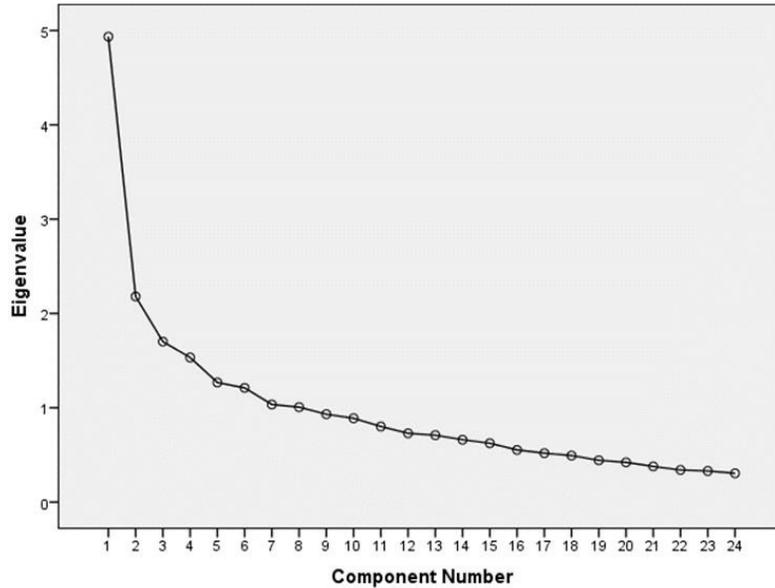


After fitting the model to the data of the study sample, however, that proposed model was unsatisfactory. The following were the indices of model fit on the original model: CFI= .16, TLI = -.01, RMSEA = .13. Such indices were far off the criteria of acceptable fit: conventionally, the satisfactory criteria for these model fit indices were: CFI  $\geq$  .90, TLI  $\geq$  .70, RMSEA  $\leq$  .05.

After rejecting the original six-factor model, I conducted an exploratory factor analysis (EFA) to explore dimensionality of the data structure. This EFA employed principle component

extraction and no rotation method. As shown in Figure 8, the result of such analysis was presented in a scree plot (Cattell, 1966).

Figure 8  
*Scree Plot of the Exploratory Factor Analysis Results*



The number of factors was inferred by the number of plot points before the plot line levels off. In this figure, four points existed before the plot line took a break and turned flat (see red circle for the point of break). This display indicated that the data structure most likely embodied four dimensions, which meant that a four-factor model most likely fit to the data structure. Additionally, cumulative variance explained for those four factors were 43.96 %, which was substantive, as a hypothetical six-factor structure had only an estimate of 55.52% of the explained variance for the six-factor solution. Based on the scree plot curve and the principle of parsimony in factor analysis, I therefore rejected the original six-factor model as an accurate measurement model. From here, I conducted a second exploratory factor analysis to specify a measurement model for this study.

**Measurement model specification.** In the second EFA, I specified the final measurement model for the study, based on the four-factor structure. Specifically, the second

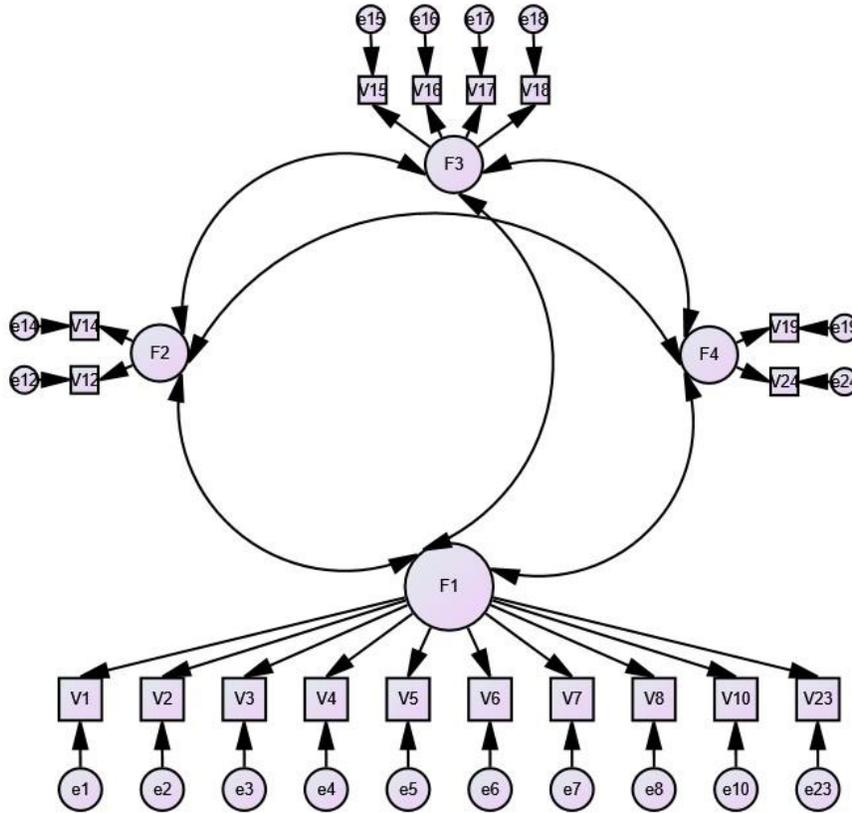
EFA helped established items and respective factors on which they each loaded. The analysis also identified items that either failed to load exclusively on one factor, or had unsubstantial loading on any factor. Based on the estimation of factor loadings from this analysis, the following items were removed from the model for ill-loading or cross-loading: V9, V11, V13, V20, V21, V22. These items were not substantive or exclusive manifests of any factor in the model, and were better off not included in the measurement model for the overall model-to-data fit. Figure 9 presents the modified four-factor model and the 18 retained items. The four factors, F1-4, each manifested through a set of items. Table 6 summarizes the established factorial structure by displaying each factor and its measures in association.

Table 6

*Factors, Corresponding Measurement Items and Item Stems in the Specified Measurement Model*

Factor	Item	Item Stem
F1	V1	“For a college or university to be ideal, how important would each of the following be to you... Have sufficient time for your personal life”
	V2	“For a college or university to be ideal, how important would each of the following be to you...Have an advisor or mentor you respect”
	V3	“For a college or university to be ideal, how important would each of the following be to you...Receive recognition for good academic performance”
	V4	“For a college or university to be ideal, how important would each of the following be to you...Feel secure as a student”
	V5	“For a college or university to be ideal, how important would each of the following be to you... Have pleasant classmates”
	V6	“For a college or university to be ideal, how important would each of the following be to you...Have engaging academic assignments”
	V7	“For a college or university to be ideal, how important would each of the following be to you...Your faculty involves you in decisions about your assignments”
	V8	“For a college or university to be ideal, how important would each of the following be to you...Attend college or university in a geographic area you desire”
	V10	“For a college or university to be ideal, how important would each of the following be to you...Have opportunities for future academic or career development”
	V23	“To what extent do you agree or disagree with each of the following statements...The college or university should have multiple sources to provide students directions”
F2	V12	“How important is each of the following to you...Living simply/having few material desires”
	V14	“How important is each of the following to you...Spending only on necessities”
F3	V15	“How often do you feel nervous or tense”
	V16	“Are you a happy person”
	V17	“Do other people or circumstances ever prevent you from doing what you really want to”
	V18	“All in all, how would you describe your state of health these days”
F4	V19	“How proud are you to be a citizen of your country”
	V24	“To what extent do you agree or disagree with each of the following statements...College or university students should not break rules, not even when breaking the rule would be ultimately bring the greater good”

Figure 9  
*Specified Four-Factor Measurement Model*



This four-factor model demonstrated a good model fit, as evidenced by the close-to-criteria values of model fit indices: CFI=.85, TLI=.80, RMSEA=. 07 (Criteria of good fit on these indices were CFI  $\geq$ .90, TLI  $\geq$ .70, RMSEA  $\leq$  .05; Kline, 2011). All item loading parameters in this model were estimated to be statistically significant,  $p < .05$ . The only exception was parameter F4→V19,  $p = .06$ . To further test the influence of this parameter to the specified model, I conducted an alternative SEM after removing it from the model. This alternative hypothetical model failed to converge, which indicated an extreme ill-fitting between this alternative model and the data sample. For the overall model-data fit, parameter F4→V19 remained in the final specified model, although it was not statistically significant at  $\alpha = .05$ .

Table 7 presents the standardized estimates,  $p$  value, and standard errors of all estimated parameters. Factor covariance was not statistically significant,  $p < .001$ , except between F1 and

F2. Correlation between F1 and F2 was moderate,  $r=.42$ ,  $p<.001$ , an association which was not strong enough to violate the independence of the factors from each other. An alternative analysis that collapsed the Factor 1 and 2 into one factor in the model, demonstrated a poor model fit, CFI =.78, TLI=.72, RMSEA=.08, which concurred on the independence of the factors. Overall, both moderate strength of correlation between F1 and F2, and the worsened model fit of the alternative analysis, were evidence against collapsing F1 and F2 into one factor. They both demonstrated that data in the present study were better modeled with the four-factor structure as described, than an alternative three-factor model should F1 and F2 be combined.

Table 7  
*B, SE, and  $\beta$  of Parameters in Measurement Model*

	<i>B</i>	<i>SE</i>	$\beta$
F1→V1	.68	.13	.38***
F1→V2	1.00		.48***
F1→V3	1.16	.17	.61***
F1→V4	1.08	.15	.67***
F1→V5	1.32	.18	.65***
F1→V6	1.12	.16	.65***
F1→V7	1.29	.19	.61***
F1→V8	.85	.16	.40***
F1→V10	.78	.12	.55***
F1→V23	.79	.13	.49***
F2→V12	.84	.16	.70***
F2→V14	1.00		.80***
F3→V15	1.00		.45***
F3→V16	-1.31	.22	-.70***
F3→V17	.84	.18	.41***
F3→V18	-1.57	.27	-.67***
F4→V19	2.66	1.42	.94
F4→V24	1.00		.34***

\*\*\*  $p <.001$ , for F4→V24,  $p=.06$ . F1→V2, F2→V14, and F3→V15 were fixed at 1 a priori for model specification.

In summary, analysis results addressing RQ1 confirmed a four-factor structural equation model as the measurement model for sequential analyses. Because this measurement model took form in the theoretical framework of the Cultural Dimensions theory, and it was confirmed as the

measurement model for the data sample in the study; thus also confirmed the adequacy of Cultural Dimensions Theory in measuring cultural values of participants in the present study. The four-factor measurement model served as the foundation for latent class analyses in RQ2 and 3, where factor scores were calculated and extracted to be the observed measures of latent classes. Appendix J presents procedures of factor score calculation and coding.

### **RQ2. LCA Analyses for Base Model: Do UO International Students Present Various Cultural Values as Predicted in Cultural Dimensions Theory?**

In addressing RQ2, I selected latent class analyses to explore whether different factor scores, calculated based on the measurement model in the previous section, presented unique patterns (unique latent classes) among the sample. This section presented results of analyses for RQ2, i.e., LCA analyses that established the base model with optimal number of classes. Based on the results, I confirmed that two unique classes of factor measures were present in the sample. This two-class model consequently formed the base for analyses addressing RQ3.

**Latent class model selection.** With recoded factor scores  $Z_{F1}$ ,  $Z_{F2}$ ,  $Z_{F3}$ , and  $Z_{F4}$  as the variables, I first specified a latent class model ( $M_{n=2}$ ) with two classes, based on the premise of LCA that multiple classes existed among the sample. Model fit indices of  $M_{n=2}$  were: AIC= 510.82, BIC=625.95, Adjusted BIC= 527.63. When I then tested a latent class model with three classes, model fit indices of the three-class model ( $M_{n=3}$ ) were as follows: AIC=515.09, BIC=689.64, Adjusted BIC= 540.58. By comparison,  $M_{n=2}$  had better fit with the data than  $M_{n=3}$ .

Moreover,  $M_{n=2}$  demonstrated sufficient model adequacy through multiple indices. Table 8 presents the model adequacy indices calculated for  $M_{n=2}$ . Average Posterior Probability (AvePP), Odds of Correct Classification(OCC), and Difference between theoretical probability and comparative probability (Dif) passed the threshold of good adequacy for C2, and C1 with

exception to OCC. Based on the model fit and adequacy indices,  $M_{n=2}$  was selected as the base model for future LCA analyses. I further calculated class prevalence in  $M_{n=2}$ , which demonstrated the probabilistic size of sample categorized in either class: Class 1(C1; 70.80%), Class 2(C2, 29.20%).

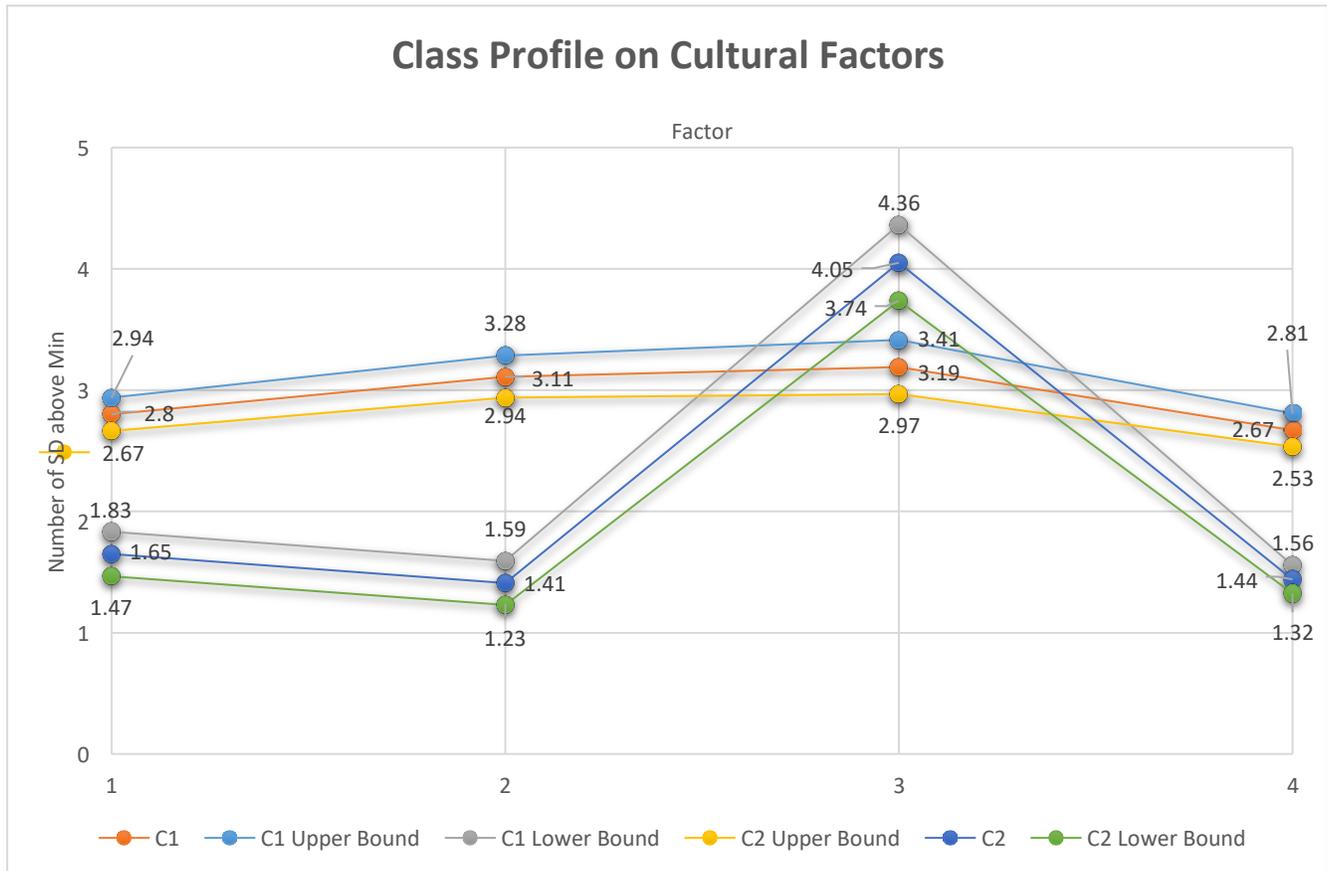
Table 8  
*Model Adequacy Indices for  $M_{n=2}$*

	Ave PP	OCC	Dif
C1	89%	3.45	4%
C2	81%	10.22	10%

Note: Thresholds of good adequacy for the three indices are: AvePP > 70%, OCC > 5, Dif < .50%. These indices of  $M_{n=2}$  indicated satisfactory level of adequacy.

To test whether there was a group difference in class structure between group of domestic subjects and group of international subjects, an equal constraint was specified on  $M_{n=2}$ . Model fit of the constrained model,  $M_{n=2, \text{constrained}}$  were: AIC=766.15, BIC=884.98, Adjusted BIC=783.90. After removing the constraint on the group equality,  $M_{n=2, \text{unconstrained}}$  presented the following model fit indices: AIC= 776.85, BIC= 1007.10, Adjusted BIC= 810.47. By comparison of model fit,  $M_{n=2, \text{constrained}}$  was confirmed to be a better model than  $M_{n=2, \text{unconstrained}}$ . The test of equal constraint thus proved that multiple classes were present in the sample of international origin, as well as in the sample of domestic U.S. origin. That is, international participants in the study presented multiple patterns of cultural values, and those patterns were present among domestic participants as well. Figure 10 presents the two patterns of cultural dimension values present in the sample.

Figure 10



*Means and 95% Confidence Intervals of Factors in Each Class Profile*

Note: 1C1= Class 1, C2= Class 2,

C1 Upper Bound= upper bound of 95% confidence intervals of factor means of Class 1;

C1 Lower Bound = lower bound of 95% confidence intervals of factor means of Class 2;

C2 upper bound= upper bound of 95% confidence intervals of factor means of Class 2;

C2 lower bound = lower bound of 95% confidence intervals of factor means of Class 2

In summary, results of analyses addressing RQ2 confirmed that two unique classes of cultural value patterns were present among the study sample. Additionally, both patterns of cultural values were present in the sample of both domestic and international participants. Such results also provided a base model for sequential analyses in RQ3, where I added covariates and distal outcomes were introduced into the model respectively, to analyze their relations with the probabilistic class membership of the sample in the base model.

**RQ3. LCA with Covariates and Distal Outcomes: If Unique Patterns of Cultural Dimension Values Exist, do They Predict Academic Success of UO International Students?**

This research question aimed to explore predictors of cultural dimensions patterns, and relations between cultural dimension patterns and academic outcomes. Based on the selected based model  $M_{n=2}$  presented in the previous section. I conducted LCA with covariates and LCA with distal outcomes. That is, the purpose of LCA with covariates was to test if any covariates on the subjects predicted class membership in the base latent class model. The purpose of LCA with distal outcomes was to test if class membership predicted academic outcomes among international participants, specifically GPA at UO, and retention/graduation status.

The following section presented results of LCA analyses with (a) covariates, and (b) distal outcomes. Results of those analyses confirmed that (a) country of origin was a statistically significant predictor of class membership (b) class membership in the model was not a statistically significant predictor of outcomes.

**LCA with covariates.** Table 9 summarizes key results of all analyses discussed below. Results of these analyses showed that country of origin was a statistically significant predictor of class membership in  $M_{n=2}$ . With probability of C1 membership as reference, country of origin predicted an increased probability of C2 membership,  $p < .001$ ,  $e^{\beta} = 7.66$ .

Table 9  
*e<sup>β</sup> of Covariates in LCA Analyses*

	M1	M2
Origin	7.66**	
Funding	2.22	.67
Sex	2.05	1.50
TOEFL	.97	1.01
HSGPA	1.45	.28

\*\*  $p < .001$ . M1: each variable was entered as a covariate separately in  $M_{n=2}$ . M2: variables with  $e^{\beta}$  estimates were entered in  $M_{n=2}$  concurrently.

No other statistically significant predictors were identified when all four controlling variables, i.e., sex, funding, TOEFL score, and HSGPA, were entered in the model at the same time. Neither was any of the controlling variables statistically significant in predicting class membership when entered individually. Country of origin was not entered concurrently with any controlling variables, because covariance can't be calculated due to singularity (all data were missing on all controlling variables, when country of origin =1 (domestic). That is, no covariance can be calculated between country of origin and any other controlling variables when entered together, because no domestic participants had measures on other controlling variables).

**LCA with distal outcomes.** Table 10 summarizes the results of LCA analyses with distal outcomes including (a) UO GPAF16, (b) cumulative UO GPA, and (c) graduation and retention status. No statistically significant predictive relations between membership in  $M_{n=2}$  and UO GPAF16, or between class membership and cumulative UO GPA. Limited variance among measures on the outcome variables led to the failure in model convergence: there was not enough variance among GPA at UO and retention/graduation status in the sample, to have estimated any relation between those outcome measures and the patterns present among participants. Therefore the analysis, with either graduation and retention status or GPA at UO as the distal outcome, did not reject the null hypothesis, which hypothesized no relations between cultural value patterns and academic outcomes for international participants in the study.

Table 10  
*Class-Specific M in LCA Analyses with Distal Outcomes*

	<i>M</i>	
	C1	C2
GPAF16	3.18	3.21
CumGPA	3.28	3.19

Note: no results with Gradret as a distal outcome was present due to model failing to converge. No statistically significant difference between C1 and C2 on outcomes GPAF16 and CumGPA,  $\alpha = .05$ .

## Summary

This chapter presented results of analyses addressing each research question. Results addressing RQ1 confirmed the cultural dimensions theory to be an adequate measurement framework and specified a four-factor structural equation model as the measurement model for analyses addressing RQ2 and RQ3. Results addressing RQ2 confirmed that two latent classes of cultural dimension factor measures existed in the study sample. In addition, both classes existed in the sample of international origin, as well as in the sample of domestic U.S. sample. Results addressing RQ3 confirmed that country of origin was a statistically significant predictor of class membership of cultural dimension factor measures, but did not find class membership to be a statistically significant predictor of academic outcomes.

Finding two classes of unique cultural dimension factors present among both domestic and international students was a strong indication of cultural diversity at the UO. Relative prevalence of each class of cultural dimension factors, in international and domestic sample respectively, was even more telling: they portrayed intricacies and nuances in cross-cultural communications in the context of one higher education institution. Such intricacies and nuances were often disproportionately dealt with by international students at UO, with little effective help from student support professionals and other campus communities. As the study further delineated cultural dimension patterns, and explored their influences on international student performance in colleges and universities, more effective support and education interventions could be developed following the study findings. I discuss the results in more detail in the next chapter.

## **CHAPTER VI**

### **DISCUSSION**

This chapter is consisted of three sections:

- limitations: where I will describe the weakness of the study design, the imperfect execution of implementation and consequently consequence, and other limitations on the study findings
- findings: where I will interpret the results of analyses in the study, and delineate the meanings of these findings in the context of each research question
- implications: where I will, based on the findings of the study, speculate their relevance and contribution, to both research and practice in the future of the study topic field

Overall, this chapter summarizes and highlights the contribution of the present study, and reiterates the significance of further research on international student development in the U.S.

#### **Limitations**

Limitations of the study findings primarily came from two aspects: study design and study implementation. In terms of design, elements of the study design rendered it impossible to interpret results in a causal manner. In terms of implementation, the imperfect implementation further narrowed generalizability of findings in the study, and increased the probability of Type II error occurring in analyses, where relations between variables did exist but were not detected.

The study was designed as a descriptive, non-experimental investigation, employing analyses to explore correlational relations between input (e.g., cultural value variables) and outcome (e.g., GPA at UO, retention/graduation status) variables. Because there was no manipulation of key input variables (e.g., random assignment of subjects who have certain kinds

of cultural values), it was practically appropriate to pursue a nonexperimental and correlational design. Nonetheless, such nonexperimental design excluded possibilities of establishing causal relations among variables of interest, thus limiting the nature of claims from this study.

In addition, the limited number of participants restrained the generalizability of findings in the study to its population. Table 11 compares demographic breakdowns between the sample and population of international subjects. Compared to the population, the international participant sample underrepresented students of Saudi Arabian origin. Compared to the population (44.1%), the international sample also overrepresented female participants (58.9%)

Table 11  
*Demographic Comparison of International Sample and Population*

Country of Origin				Sex	
Population		Sample		Population	Sample
China	75.2	China	50.9	Female 44.1	Female 58.9
Saudi Arabia	4.5	Korea	5.4		
Korea	3.3	Mexico	4.5		
Japan	3.0	Japan	4.5		
Taiwan	2.9	Indonesia	3.6	Male 55.9	Male 40.1
Indonesia	1.1	Venezuela	1.8		
Canada	.7	Singapore	1.8		
Hong Kong	.7	Saudi Arabia	1.8		

Table 12 presents the comparison of sex and race/ethnicity between the sample and the population of domestic subjects in the study. Noticeably, the study sample overrepresented female participants (14.6 % of the sample were male, in contrast with 37.8 % in the domestic participant population); Asian/Pacific Islander participants were slightly overrepresented (9.4% in the sample in contrast with 5.3% in the population).

Table 12

*Percentage Comparison of Sex and Race/Ethnicity between Domestic Population and Sample*

Sex	Population (N=1000)	Sample (n=137)	Race/Ethnicity	Population (N=1000)	Sample (n=137)
F	54.7	79.6	White	56.8	46.4
M	45.2	20.4	Hispanic or Latino	10.6	7.3
			Asian	5.3	9.4

*Note:* F=Female, M=Male, White= White Non-Hispanic, Hispanic= Hispanic/Latino, Asian=Asian/Pacific Islander

The limited number of participants also imposed a limitation on the generalizability of findings to the study population, and increased the probability of type II errors in analysis results. Albeit an extensive campaign of participant recruitment during the implementation, a total of 304 participants were recruited and provided valid measures for RQ1 and RQ2. 112 out of 304 participants granted the study access to external data necessary for analyses addressing RQ3, so the sample size for analyses addressing RQ3 was 112. Because analyses employed for both RQs required a substantial sample size (at least 300 for factor analyses in RQ1, and at least 100 for latent class analyses in RQ2 and RQ3), the actual sample sizes in the study limited the power of such analyses, which decreased the chance of detecting statistically significant relations at  $\alpha=$ . 05. Consequently, null hypotheses in analyses for both RQs in the study sample became artificially harder to reject than those in the targeted population.

**Findings**

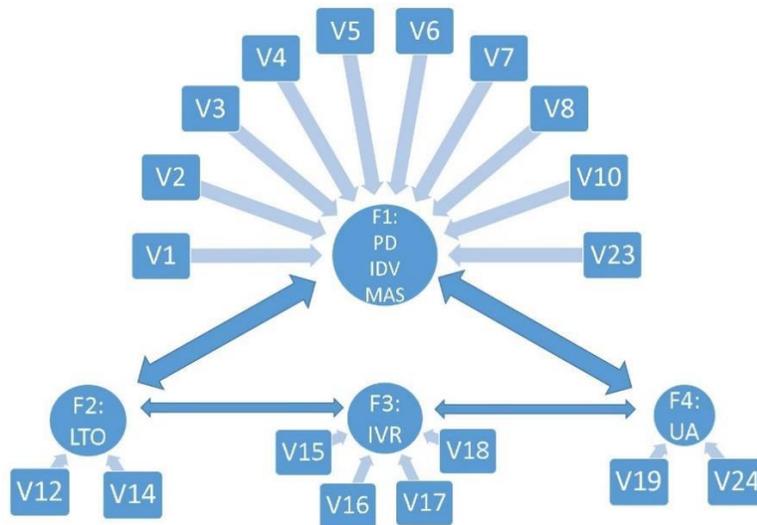
In this section, I will present and explain the findings that address each research question respectively, and delineate the scope and depth of these findings based on the results of analyses and other parameters of this study. Specifically, for RQ1 I will discuss the four factors found in analyses and cultural dimensions to which they responded; for RQ2 I will describe latent class

profiles of groups among participants, and cultural dimensions they each represented. For RQ3, I will speculate (a) the potential findings the analyses, if not failing to reject the null hypotheses statistically, could present, and their contributions to addressing RQ3.

**RQ1 Cultural dimension factors.** Figure 11 illustrates cultural dimension factors confirmed by results of CFA analyses in RQ1. Based on the constitution of measurement items, and how they each corresponded to the original six cultural dimension factors in the theoretical framework (i.e., PD, IDV, MAS, UA, LTO, IVR), the four factors present among the study sample were confounded factors based on the original six cultural dimensions.

Figure 11

*Cultural Dimension Factors and Measurement Structure Confirmed through Analyses*



Among the four factors, F1, with its ten measurement items, is a mega factor of PD, IDV, and MAS. All items constructed to measure PD, IDV, and MAS in the theoretical framework responded to this confounded factors (except items that were excluded from analyses for ill-loading). F2 was measured by V14, the only statistically significant measure of LTO preserved in the measurement model (factor loading of V19, the other measurement item for LTO, was not

statistically significant at the effect size of  $\alpha=.05$ ). F2 was Thus interpreted a factor of LTO. F1 and F2 adequately represented four of the six cultural dimensions in the theoretical framework.

Findings regarding interpreting the other two factors were more theoretically intertwined. Features of the measurement structure were considered in explaining. F4 were measured by items V19 and V24, which corresponded with IVR and UA respectively. As discussed before, factor loading of V19 on F4 was not statistically significant, thus a weaker measurement item when compared to V24, which was a statistically significant measurement item for UA. Therefore, F4 was interpreted as a factor of UA. Given that F4 corresponds to UA in the theoretical framework, and that F3 was statistically independent from F4 (correlation between F3 and F4 was not statistically significant at  $\alpha=.05$ ), F3 was interpreted a factor of IVR, although measured by items measuring both IVR and UA (V15 and V18 which measured UA; V16 and V17 measured IVR. All parameters were statistically significant). Table 13 summarizes the theoretical interpretation of the four factors confirmed in the study. Based on the cultural dimensions each factor reflected, the four factors in the measurement model were hereafter referred to as, PD-IDV-MAS Factor, LTO Factor, IVR Factor, and UA Factor.

Table 13  
*Theoretical Interpretation of Factors Found in the Study*

Factor in the Study	Cultural Dimensions	Explanation
F1	PD, IDV, MAS	level of acceptance and expectation to unequal power distribution; of integration into social groups, convergence of values and behaviors towards those of in-group members; of equal distribution of emotional roles across genders
F2	LTO	level of orienting behaviors towards future interests instead of past or present ones.
F3	IVR	level of allowances towards human desire-driven behaviors
F4	UA	level of comfort towards uncertainty

Such four-factor measurement model, with its associated cultural dimension values as above, brings an important indication to the knowledge of cultural values among international students in the U.S. higher education. Although not all six cultural dimensions in the Cultural Dimensions theory were identified in the study, such diminishing or restructuralizing of dimensions in an empirical study within a specific context is within the boundary of the theory. When applied to a specific population within an organizational context less comprehensive than national societies, not all dimensions of cultures present on the national level were present in a localized context (see Hofstede, Garibaldi de Hilal, Malvezzi, Tanure & Vinken, 2010, an empirical study that applied the Cultural Dimensions theory to regional cultures within Brazil; the confirmed cultural dimension structure was different from the original six-dimension structure as well). With four factors in association with all six dimensions in the original theoretical framework, the measurement model supports the conceptual utility of the Cultural Dimensions Theory in understanding cultural diversity among international students in a specific U.S. higher education institution. The measurement model identified in the study indicated the potential of dimensionalizing cultural values among international students.

Set at the University of Oregon, the population of interest for the study most likely embodied less than a full spectrum of cultural values. Given that more than 50 percent of international sample in the study were from China, and that more than 40 percent of domestic sample was White/Caucasian, cultural trends within the sample might be more pronounced than that on the state-nation level. Therefore, certain sets of cultural value measures on power distance, individualism, and masculinity could be so prevalent, that the factor of power distance, individualism and masculinity could not be further dissected. The unique demographics of the study sample also supported the potential of a four-factor measurement model.

**RQ2: Profiles of cultural dimension patterns.** Figure 11 compare means of the four factors between subjects of two latent classes, C1 and C2. Results of analyses regarding RQ2 indicated that there were two distinctly different cultural dimension patterns present among the study sample. Constituting 70.80% of the study sample, subjects who were probabilistically in C1 had the following cultural dimension pattern: on average, their measures on cultural dimensions of PD, IDV, and MAS were 2.80 standard deviation (SD) units above the minimum value in the whole sample; their measures on LTO were 3.11 SD units above the minimum; IVR measures were 3.19 SDs above the minimum; UA measures were 2.67 SD above the minimum. In comparison, constituting 20.20% of the study sample, subjects probabilistically in C2 had the following cultural dimension pattern: average measure on cultural dimensions PD, IDV, and MAS, 1.65 SD above the sample minimum; average measure on cultural dimension LTO was 1.41 SD above the minimum; average measure on cultural dimension IVR was 4.05 SD above the minimum; average measure on UA was 1.44 SD above the minimum. The two classes of subjects had distinctly different profiles on these cultural dimension measures, where subjects in Class 1 had on average higher measures on all cultural dimensions, except on IVR.

In addition to the confirmation that unique cultural patterns present among the whole study sample, the group equality constraint results for RQ2 also confirmed that those unique cultural dimension patterns were present among international subjects in the sample. Group equality constraint was applied to the domestic student group and international student group in addition to the base model, which outperformed the unconstrained model in model-data fitting. The preference over equal constraint over unconstraint indicated that measures of international student sample also present two distinctive patterns as much as the whole sample. So was confirmed that unique cultural dimension patterns existed among international student sample. Probabilistically, 59.82% of international student sample was in C1, 40.18% was in C2.

Put those patterns in its theoretical framework, those two distinctive patterns of cultural

dimension values portrayed two distinct profiles of students in the study. For those participants probabilistically falling in the pattern of C1, they tended to be more tolerant towards power inequality, more oriented by group values and behaviors, and more open towards equal distribution of emotional roles across gender (F1, a conglomerate factor of Power Distance, Individualism v.s. Collectivism, and Masculinity). They also tended to be more long-term oriented in prioritizing future over present or past (F2: Long-term Orientation), less indulgent in human pleasure and desire (F3: Indulgent v.s. Restraint), and more comfortable with uncertain future (F4: Uncertainty Avoidance). In contrast, participants probabilistically categorized in the C2 pattern tended to be less tolerant towards power inequality, more individualistic in values and behaviors, and to hold stricter gender roles in emotions. In addition, they tended to be more short-term oriented in valuing interests of present or past over long-term interests,

**RQ3: Cultural dimension pattern prediction of outcomes.** Due to failure in identifying statistically significant relation at  $\alpha=.05$  level between cultural patterns and outcome variables, analyses regarding RQ2 failed to reject the null hypotheses that there was no predictive relation between cultural dimension pattern and academic performance, nor between cultural dimension pattern and retention/graduation status among international students in the sample. Two potential explanations for and speculations on the failure are thus discussed below.

The first potential explanation for the failure to reject the null hypotheses could be, as suggested by the hypotheses, that cultural dimension patterns of international students don't predict their academic performance, or their probability of being retained or graduating from the university. To further investigate such explanation, further studies need to be conducted which employ more robust samples of subjects that present different cultural dimensions patterns. Should such studies fail to reject the null hypotheses, it would be more likely that cultural dimension patterns of individual international students do not in fact relate to their academic performances, or their retention and graduation.

The second potential explanation for the failure to reject null hypotheses could be that the power of the statistical analyses in addressing RQ3 was diminished by an insufficient sample size in the study, that the predictive relations between cultural dimension patterns and academic outcomes were not detected at the level of effect size  $\alpha = .05$ . As discussed in the limitations section, for a Wald Test to detect a statistically significant relation between class membership and outcome variables in RQ3, a sufficient sample size is estimated to be between 500 and 700 (Gudicha, Tekle, & Vermunt, 2016). Given that the sample size was insufficient in analyses addressing RQ2 ( $n = 112$ ), future studies with a larger sample size might be able to detect such relations between cultural dimension patterns and academic outcomes.

Like analyses regarding academic outcomes, no controlling variables other than nationality were found to predict cultural pattern membership, at a statistically significant level. In terms of nationality, international students were predicted to have 7.66 times the chance of presenting a cultural dimension pattern of C2 as those of domestic students in the study. This finding, when contextualized in the cultural dimension profiles of C1 and C2, proposed a unique portrait of cultural diversity among participants in the study. Compared to their domestic counterparts, international participants were more than 7 times more likely to be intolerant to power inequality, more individualistic, and stricter with gender roles in emotions (PD-IND-MAS Factor). International participants, more likely than domestic students, tended to prioritize present or past over future, to indulge in pleasure and fun, and uncomfortable towards uncertainty in the future. This finding reflected a potential of self-selection among international students who chose to study in the U.S. Aligned with what they perceived as cultural norms in the mainstream U.S. college-going population, international students might harbor those values overcompensatingly.

## **Implications**

The previous section discussed the findings regarding the research questions in the

study. In summary, there were multiple unique cultural dimension patterns present among international students in the study, on four factors each regarding the following cultural dimensions: Power distance, Individualism, and Masculinity (PD, IDV and MAS); Long-term Orientation (LTO); Indulgence v.s. Restraint (IVR); and lastly Uncertainty Avoidance (UA). Two unique cultural dimension patterns were confirmed among international students in the study: pattern. Pattern 1(C1) presented high level of (a) Power distance, Individualism and Masculinity, (b) Long-term Orientation, and (c) Uncertainty Avoidance. Meanwhile, Pattern 1 presented a relatively low level on (d) Indulgence vs. Restraint. In contrast, Pattern 2 (C2) presented a relatively low level on (a) Power Distance, Individualism and Masculinity, (b) Long-term Orientation, and (c) Uncertainty Avoidance, as it presented a relatively high level of (d) Indulgence v.s. Restraint.

Although international students were found to have a substantively higher probability of presenting cultural dimension pattern 2 than their domestic counterparts, there was no statistically significant predictive relations found between one's cultural dimension pattern and ones' academic outcomes. Failure to rule out the nonexistence of predictive relations between cultural dimension pattern and academic outcomes could indicate that such relations do not exist, or it could be explained by the study sample's insufficient size to surpass the threshold of statistical significance at the previously established level of effect size.

In the following section, I will discuss the implications the present study brought forward to (a) future research in the field of international student development in US higher education, and (b) practices in international education and student services in higher education.

**Implications for future research.** The present study provided two directions for future research in the field of international student development in US higher education. First, the present study suggested that research studies on international students in higher education should avoid treating culture as a non-dissectible, and immeasurable entity by which international

students are predetermined. Second, future research concerning the success of international students in US higher education should adopt the framework of Cultural Dimensions Theory, either as the theoretical underpinning of the study design, or lens of interpretation in understanding findings in studied phenomena regarding international students. Building upon the findings of the present study, research questions investigating change of cultural values over time among international students in the U.S. naturally follow the same line of inquiry.

The first direction of implications the present study has for the future research in the field is to demystify culture in international student experiences. Although cultural adaptation was a well acknowledged element of experience international students had attending US colleges and universities, its influence on student experience, particularly behaviors and progress through educational programs were neither well researched, nor consistent across studies (see Chapter 1 for more discussion on cultural adaptation in the current research literature). Such insufficiency in research that further investigates the role of a well-acknowledged element like cultural adaptation speaks to the underlying assumption: culture is a non-dissectible and immeasurable entity in the context of international student development. The present study provided an alternative to such assumption, which challenges the future studies to adopt a dynamic framework in approaching culture. In the study more than one unique cultural dimension patterns were found present, within international students and within domestic students. The multiplicity of unique cultural dimension patterns, between and within international and domestic students, implies that culture can be further nuanced on measurable dimensions in the context of higher education student experience. Such implication should also propel researchers in the field to take closer examinations of different cultural dimensions, when discussing the role of cultural adaptation in international student development.

In addition to demystifying cultural adaptation as an immeasurable entity, the multiplicity of cultural dimension patterns among international students also dissuades future research from

assuming commonality within international student population, particularly in value-oriented constructs such as success. The current research literature was embedded in three different orientations when it comes to defining success for international students in the context of US higher education (see chapter 1 for discussion on definition of success): (a) domestic-centered normative orientation, (b) international-and-individual-centered orientation, and (c) international and institutional dynamic orientation. The multiplicity of cultural dimension patterns within both international and domestic students discredits the domestic-centered normative orientation for assuming value unity among domestic students. In return, such multiplicity supports a dynamic definition of success negotiated between institutions and international students of different cultural dimension patterns, as in the international and institutional dynamic orientation.

The second direction of implications the present study provides to future research in the field is to apply Cultural Dimension Theory in research studies. The theory can be used to construct measurement structures for cross-cultural interaction of international students. It can also be used as a theoretical framework for studies that investigate the influence of culture on international student development. The present study first validated a measurement framework of cultural dimensions based on Cultural Dimensions Theory. It then applied the theoretical framework in interpreting the variance of values and behaviors within and between international students and their domestic counterparts. Due to the limitations of the study, the potential of Cultural Dimension Theory was yet fully revealed. Future research should take from where the study left unexplored, and further utilize this theory in understanding the mechanism of international student success in US higher education.

In terms of applying the measurement framework, future research studies should intend to increase the representativeness and robustness of the international student sample, in avoidance of omitting small but prevalent cultural dimension(s). One limitation for the present study was the limited sample size and representativeness of international students (see

Limitation section for more details). Although two cultural dimension patterns were detected among the international student sample, future research with more robust samples would likely establish more than two cultural dimension patterns, or find cultural dimension patterns with more nuanced factors than the four factors in the present study. The richness of cultural values may thus be better preserved in studies with robust samples, which could further support delineation of mechanism of culture or cultural adaptation on student success.

Another aspect of applying the theory as a measurement framework in future studies is to further validate the measurement instrument developed in the present study. The present study revised an established instrument in the same theoretical framework of Cultural Dimensions Theory, and adapted the instrument to its specific context such as the study site, the population and the methods for implementation (see Chapter 3 for instrument development). Through analyses of measurement validation, 6 items were excluded from the final measurement model for ill-fitting. Future studies may further explore the measurement validity of the instrument in the present study. With more robust data from more representative samples, an instrument with higher validity could be developed for a broader range of contexts.

Different from applying the theory as a measurement framework, a theoretic framework based on Cultural Dimensions Theory can expand the horizon of what is malleable and optimal in international student development. The present study, limited by practical implementation, did not investigate the flexibility of those cultural dimension values among international students in the study. Although previous research studies discussed the flexibility of psychological adaptation of individual international students (see Hirai, Frazier, & Syed, 2015), cultural dimension patterns that go beyond individual values and behaviors have yet been tested on their malleability. Moreover, due to insufficient sample size, the present study did not conclude whether certain cultural dimension patterns predict better academic outcomes for international students. Future research may establish optimal cultural dimension patterns in terms of its

predictability to better academic outcomes, either in a specific context or a range of context.

Such optimal patterns could be of great significance in both research and practice.

Besides the two directions for future research efforts regarding international student development in U.S. higher education, two research questions, investigating potential change of such cultural values over time among this population, are the natural next in line of inquiry. As included in the original proposal for the present study, future research studies with the intention of expanding or replicating the present one could expand the scope of inquiry into observing potential changes of cultural values. According to third-cultural building model (Casnir, 1999), international students' cultural values might change over time with experience and intensiveness of cross-cultural interactions. Building upon the findings in the present study that provided an empirically validated measurement model of cultural dimension values, future studies could utilize those cultural value measures, adapted to the specific context of its institution and student population, and track potential changes more symmetrically. Such changes, once described, could also bring home a deeper understanding of the nature of cultural diversity and its malleability in the context of higher education. Next will be the research question that explores relations between characteristics of cross-cultural interactions and change of cultural values. Such relations, if identified, would lay the foundation for understanding and design support services for international students' success in U.S. colleges and universities.

**Implications for practice and service.** The present study attempted to answer questions closely related to practices of student support and services in US higher education, as international students have been the most rapidly increasing subpopulation in college and university enrollment in the recent decade (see Statement of the Problem for international student enrollment in US higher education). Specifically, the implications the present study findings provide for practice and service in US higher education are in twofold: (a) cultural

dimension patterns could help staff in student services better serve international students at their higher

education institution (b) it is of strategic interest for US higher education to regularly gauge cultural dimension patterns of current and perspective students.

As discussed in details in Statement of the Problem, higher education institutions, for purposes including financial and academic benefits, have kept actively recruiting and enrolling students from across the world. Challenges of such prevalence of students from different cultural backgrounds have thus been pressuring student support services on each campus. The present study discussed the meanings of different cultural dimension patterns, which are insights for institutions to provide more attentive support for their students with a range of cultural values and behaviors. When confronted with cultural differences in communicating with international students, faculty and staff should be empowered to further analyze these challenges in the framework of cultural dimensions. What dimensions of cultural values are present in the difficult scenario of cross-cultural communication? What do patterns of faculty or staff on those dimensions look like in comparison to that of the student(s)? What other dimensions could be that place of comfort for both parties to restart the communication with mutual understanding? These questions lead to increased knowledge of cultural dimension patterns present among various campus communities, which further enriches the multicultural organization.

In addition to improving student support services provided to international students, implications can also be drawn from the present study on strategic planning of both higher education institutions and perspective international students. Since it is imperative for higher education institution to prepare all students for success and enrichment, it is critical for each institution to regularly take stock of cultural dimension patterns present within its own students, i.e., strengths and weaknesses of such pattern constellation. Based on the existing cultural

dimension patterns, policies and strategic plans can be made to enrich the experience of all students by further diversifying cultural dimension patterns present within the campus communities. Should future studies in the same framework identify optimal cultural dimension patterns, institutions could plan strategically in admitting perspective international students whose cultural dimension patterns prepare them for success. If further research identifies flexibility of cultural dimension patterns, institutions can also create for and encourage participation in intentionally designed experiences from international students.

## APPENDIX A

### CRITERIA OF SUCCESS FOR INTERNATIONAL STUDENTS IN US HIGHER EDUCATION

Study No.	Success Criteria	Statement for Inference
1	intercultural communication competence	“The demands in the labor market and in society have resulted in frequent calls from stakeholders in higher education to prepare students who would be able to function effectively in a diverse global society.”
2	Educational, social and cultural goals of international students met by institutional services and resources	“The common thread running through the research suggestions is that the institution has a responsibility to its international students—as it does to all students...it was clear that they [study participants] had a certain expectation that their respective colleges should offer them the services and resources for which they are paying”
3	Effective email communication with faculty comparable to American students	“International students at American universities need to be aware of how native speakers of English use the electronic medium, and how to do this in an effective, yet status-congruent manner”
4	Recruitment and retention of international students by meeting international student needs	“Asking for and paying attention to the details that support international students in their quest to receive an American education will support the students where they need it and also provide an atmosphere that will encourage more international students to follow”
5	International students social adjustment to the university environment and consequentially academic persistence	This article focuses on the aspect of everyday cross-cultural experiences that involved campus diversity initiatives aimed to help international students adjust to campus life. For the purposes of this study, adjustment was defined as the process through which students acclimate socially and emotionally to life in a new environment (the university) and culture (domestic culture in which the campus is located).
6	International students acculturation and adaptation	“The premise of the acculturation theory provides a helpful framework to explore the factors that influence international doctoral students’ adaptability to the U.S. academic culture and ability to maintain (or not) relationships with members of the American society”
7	International students acculturation and adjustment	“When these stresses become particularly intense, adjustment to the new cultural might be hindered, so the students experience anxiety and disorientation”

8	Recruitment of Asian students in music majors; academic success; student satisfaction with educational experience	“This information could be beneficial for both US higher education music institutions and international music students in their institutions in that the institutions could develop strategies to attract more East Asian international music students to their institutions and the students could avoid pitfalls and increase their opportunities in the music institutions”
9	Academic achievement (GPA)	“The overall purpose of this study is to examine the relationships between acculturation, academic self-efficacy and academic achievement of international students who are studying in the United States” (p.5)
10	Academic success (completion of program)	“The goals of the current study are to understand differences between international and domestic doctoral students’ experiences in an effort to illuminate this apparent paradox [between unique difficulties international students face and higher rates of and faster completion of programs] and to identify factors that may contribute to all doctoral students’ feelings of support and academic success”
11	Adjustment to a U.S. higher education institution	“the research study aimed to understand the social, linguistic and academic experience of those students who completed Summer Bridge and to understand how it contributed to their adjustment upon enrollment in an American higher education institution”
12	International student social, cultural, academic and psychological adjustment	“As such, this phenomenological case study sought to enhance an understanding of the challenges faced by African international students and enable this urban metropolitan research university to tailor its support systems to meet their social, cultural, academic, and psychological needs by providing culturally sensitive and appropriate programs” (pp. 15-16)
13	Academic success (GPA)	“Because high-stake decisions are made with heavy use of the traditional admissions criteria, it is important to examine how effectively these admissions factors predict academic success in college and graduate studies”
14	Cultural adjustment to American university environment	“The purpose of this study is (a) to examine the self-efficacy beliefs of international graduate students as compared to their American counterparts and (b) to examine the factors that contribute to the socio-cultural adjustment of students from both groups” (p.10)
15	Satisfaction with service and program; integration into American society	“In response to the survey, an increase in resources might be beneficial in the areas of activities for socialization, networking, and integration, as well as ongoing support after initial enrollment in the program and college”

16	Academic success	“The focus of this research addresses the academic needs of this population and to acknowledge the cultural, emotional, personal, and environmental needs as they relate to academic success”
17	Psychological and sociocultural adjustment	“It is imperative to examine international students’ adjustment and its predictors to inform psychological interventions and campus programs to improve the quality of international students’ experiences”
18	Effective teaching & learning for East Asian graduate students	“Third, with an understanding of what the academic unit offers and how the students respond, the ultimate goal of this study was to bring them closer by means of deliberating a feasible academic support system that these students would appreciate”
19	Cultural adaptation in American universities and colleges	“Future AWIS, or perhaps even all international students, might better prepare for their days as sojourns knowing such information upfront, possibly saving them from disappointments and regret as experienced by some of the participants in this study”
20	Social adjustment and academic success	“Thus, the purpose of this study is to investigate the role of social networks in the adjustment and academic success of international students”
21	Emotional and psychological adjustment	“The purpose is to examine this phenomenon [alienation] further”
22	academic and cultural adaptation	“the purpose of the study was to assess the effect of the first-year foundations course as an intervention for international students’ academic and cultural adaptation by measuring participants’ academic skills and psychosocial development upon completion of the course”
23	Integration into American campus life as related to international student persistence	“This study explores the concept of integration into campus life as it relates to international student persistence”
24	Program completion	“Given that the research establishes a clear connection between completion rates and various aspects of the relationships between students and their advisors, this research seeks to answer the following questions: how do international doctoral students at a Research I institution navigate through their degree programs and what are their perceptions of the role their dissertation advisors play in their degree completion?”
25	Teaching and learning effectiveness for Asian international students	“Given the increasing global diversity in student demographics in higher education, it becomes critical for instructors to understand NNES international graduate students’ cultural and linguistic challenges in order to facilitate effective teaching and learning for all students”

26	International student coping with academic stress	“This study adds to the body of knowledge concerning students’ academic stressors and reactions to stressors”
27	Academic and social success	“The purpose of this study is to learn more about the adversities international students face when enrolled in U.S. doctoral programs and the adjustments they must make to succeed academically and socially”
28	International doctoral student experience	“It is hoped that this study will bring the spotlight to common themes, issues, challenges, and aspirations that could help improve understanding among international students who come from similar cultures and seek doctoral degrees in the United States”
29	Program completion	“It would be a prudent initiative, therefore, to develop and refine adequate models for the selection of international students for post-baccalaureate study in the United States”
30	international student pedagogy	“it is crucial that international students be allowed opportunities to write creatively in both their native and nonnative languages in order to help them succeed in all of their university courses”
31	Cultural, social, and academic transition	“This research investigated the challenges that international ESL students face as they begin their program. In particular, it looked at challenges in cultural, social, and academic transitions into U.S. higher education in an intensive English language program at a large research university in the Midwest”
32	Academic and social integration	“Therefore, it is important to explore what motivates them to integrate into college life and what factors impact this integration process”
33	International student self-concept	“Because some evidence exists that students are generally satisfied with their life, this study postulated that self-concept is not necessarily negatively impacted by international student life”
34	International student pedagogy	“The primary goal was to examine the interplay of host and native cultures in an online learning environment and study its effect on international students’ learning experiences”
35	Academic success (GPA)	“The purpose of this study was to determine the relationships between Sedlacek’s (2004b) student noncognitive variables...and the field of study to the academic success of international graduate students from different countries, as measured by the cumulative grade point average and expected time to degree completion” (p.8)

36	Academic and social adjustment	“The central purpose of this study was to investigate the academic and social issues of adjustment to American culture and higher education for undergraduate international students at the University of Tennessee” (p.17)
37	Academic and social experience	“Major goals of this study were to examine the perceptions of current international students about their academic and social experiences at ECU and recommend necessary improvements to attract more international students to the campus” (n.a.)
38	Social and cultural needs and participation	“With the above views in mind, this study attempts to make a linkage between the student affairs study, exploring the needs of international students, and social and cultural participation study” (p. 20)
39	Recruitment and retention of international students by helping international students achieve their personal and professional goals	“This indicator, however, does little to demonstrate how higher education engages international students in internationalizing U.S. campuses while simultaneously helping these students achieve their personal and professional goals” (p.8)
40	Academic experience (engagement in campus culture)	“...mechanisms that universities can implement to encourage their participation in campus culture, thereby improving not only their academic experiences, but that of the entire campus community” (p.48)
41	Identity conflicts, (re)negotiation and reconstitution of international students	“...rather than trying to fit female international graduate students into the dominant culture’s discourse of homogeneity, adjustment, and regulation, we can try to engage with them in an exploration of identity conflicts, (re)negotiation, and reconstitution that are often hidden in the studies of international students” (p.25)
42	Effective learning environment for international students	“the purpose of the study is to provide the University of South Carolina with information so that it can create a more effective learning environment for its students” (p. 40)
43	International students’ adjustment to the American university life through unique coping and help seeking beliefs and behaviors	“... it is an attempt to investigate and describe the stressors and adjustment concerns of students from People’s Republic of China... Second, this study seeks to expand an understanding of Chinese students’ beliefs and behaviors regarding coping and help-seeking” (p.3)

44	Academic learning of Chinese international students in a second-language environment like US higher education	“By using both survey and follow-up interviews, this research study situated language anxiety in the U. S. higher education academic context and explored its perceived impact on Chinese international students in their academic learning process at four universities in the northeastern region of the United States” (p. 5)
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*Note:* Studies defining success in international-and-institutional dynamic orientation: 1, 2, 4,9, 10, 12, 13, 16, 24, 29, 35, 39, 43; in domestic-centered normative orientation: 3, 5, 6, 7, 8, 11, 14, 15, 17, 19, 21, 22, 23, 27, 31, 32, 36, 40; in international-and-individual-centered orientation; 18, 20, 25, 26, 28, 30, 33, 34, 37, 38, 41, 42, 44.

**APPENDIX B**

**SUPPORTIVE FACTORS AND CHALLENGES OF INTERNATIONAL HIGHER  
EDUCATION STUDENT SUCCESS**

	1. (11)	2. (18)	3. (23)	4. (12)	5. (2)	6. (7)	7. (3)	8. (8)	9. (10)	10. (7)	11 (3)	N.A (8)
A.(14)	8 18 31 3239	34 39 44	6 18 31 32 34 41 44	24 31	18	41	3 6 18	41	20 32 39	28 32 39	39	10
B. (4)	32 38	32 38	32 38						32	28 32		35
C. (6)	8 17	8 30	8	26		32						22
D. (17)	6 17 31 32 38	19 20 32 34 38 43 44	2 12 19 20 31 32 34 38 44	20 24 31 43	27	12 31 32		12 19 20 21 27	12 19 20 27 32	12 28 32		35
E. (7)	6 32 38 39	29 38 39	5 32 38						32 39	32 39	39	1
F. (6)	38 39	34 38 39	5 7 34 38						39	39	39	1
G. (10)	25 31 32 39	25 32 39 43	12 25 31 32 37 41	24 31 37 43		12 32 37 41		12 37 41	12 2832 39	12 32 39	39	
H. (2)		32	41			41		41	32			
I. (4)	25	25 43	25	43								1 22
J. (4)	18	11 16	11 18 36	18	18	36	18					
K. (5)	17 33	30		33								9 35
L. (4)	38	38	38									1 13 23
M. (3)			4 36									23
N. (3)	40	40	15 40	42					40 42	40	42	
O. (8)	32 39	11 32 39	4 11 15 32	2 11 24 42					32 39 42	32 39	39 42	
P. (1)		44	44									
Q. (3)	38	7 38	38	7								1
N.A (5)		2 27				27		43	43	4 43	43	29

*Note:*

1. Maintain relationship with Americans
2. English communication
3. Cultural adaptation
4. Academic hardship
5. Procrastination
6. Discrimination/stereotype
7. Lack initiative
8. Isolation
9. Logistic difficulty
10. Financial Hardship
11. Lack practical experience/opportunity

- A. Faculty relationship
- B. Recognition/sense of belongingness
- C. Psychological wellbeing
- D. Social network
- E. Solidarity
- F. Cultural presence
- G. Dedication and value of quality education
- H. Institutional diversity makeup
- I. Coping Strategies
- J. English ability
- K. Self-efficacy
- L. Grades
- M. Retention
- N. Satisfaction
- O. Staff support
- P. Length of stay
- Q. Openness

*N.A. means no promotor or inhibitor was concluded in the study.* Studies with underscored numbers followed international-and-institutional dynamic orientation in defining success; studies with bolded numbers followed international-and-individual-centered orientation; others followed domestic-centered normative orientation.

## APPENDIX C

### MEMO REGARDING REMOVING RQ 3 AND 4<sup>1</sup> FROM DISSERTATION STUDY

Nov. 29, 2016

Dear Dissertation Committee,

I hope this email finds you well. I want to inform you of the progress of my dissertation study, and ask for your feedback on amending the approved proposal.

The first wave of data collection has been challenged with less than the expected number of responses. Until today (Nov 28<sup>th</sup>, 2016), the participant recruitment has been ongoing for 7 weeks. Currently, the numbers of new international student participants, continuing international student participants, and domestic student participants who have responded to the survey are 25, 111, and 115 respectively. During the first phase of recruitment I used a range of recruitment methods and strategies: email invitations and reminders, social network postings, printed and digital flyers, and group meeting announcements. With the past three weeks witnessing only five new participants, I believe that the first-wave data collection has been saturated. Therefore, I plan to conclude the first wave of data collection with a last round of email reminders, and closing the surveys by the end of Week 11 of the fall term (Dec. 9th).

Assuming that there wouldn't be a significant increase of participants in the remaining weeks in the first wave of data collection, I would like to amend the approved proposal by removing RQ 3 and 4, and the activities related to those questions. The study will not look into the potential change of cultural values over time among new international students at UO, nor potential predictors of such change through third-cultural building model. This also means that I will complete data collection at the beginning of the winter 2017 term, and proceed to analyses and writing.

After consulting with Dr. Van Ryzin, I am convinced that the total number of all participants (currently 251) should be efficient to conduct analyses to address RQ1; with 98 participants giving access to external data. The original analyses to address RQ2 are still feasible, although with limited statistical power. It means that with data collection closing by the end of Week 10 this term, the plans and activities related to RQ1 and RQ2 will remain unchanged. However, with too few of new international student participants (currently 25 in total), it is impractical to collect data among these participants again in the beginning of the winter term, and expect a detectable change in cultural dimension constructs even less so for association between frequency and intensiveness and such change. Thus analyses for RQ3 and RQ4 can not be carried out.

Please consider the circumstances of the above amendment, and kindly provide your feedback. To preserve the originally proposed timeline, I would appreciate it if you could return your feedback to me before the end of week 10 (Dec. 2<sup>nd</sup>).

Thank you very much!

Sincerely,

Yue "Adam" Shen

Ph.D. Candidate, Educational Methodology, Policy and Leadership

---

<sup>1</sup> RQ3 and 4 here referred to so-numbered research questions in the original proposal, which were later renumbered RQ4 and RQ5 in the dissertation manuscript. RQ1 and RQ2 here referred to the so-numbered questions in the original proposal, which were reorganized as RQ1, 2 and 3 in the manuscript.

## APPENDIX D

### SURVEY INSTRUMENT PROTOCOL

The following questions ask about your perspective of higher education. Please think of a college or university environment you consider ideal. For a college or university to be ideal, how important would each of the following be to you? On a scale of responses ranging from "extremely important" to "not important at all", please choose one and only one response to each question.

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not Important at All
1. Have sufficient time for your personal life	<input type="radio"/>				
2. Have an advisor or mentor you respect	<input type="radio"/>				
3. Receive recognition for good academic performance	<input type="radio"/>				
4. Feel secure as a student	<input type="radio"/>				
5. Have pleasant classmates	<input type="radio"/>				
6. Have engaging academic assignments	<input type="radio"/>				
7. Your faculty involves you in decisions about your assignments	<input type="radio"/>				
8. Attend college or university in a geographic area you desire	<input type="radio"/>				
9. Attend a university that is respected by your family and friends	<input type="radio"/>				
10. Have opportunities for future academic or career development	<input type="radio"/>				

The following questions ask your perspective of general personal life. How important is each of the following to you? On a scale of responses ranging from "extremely important" to "not important at all", please choose one and only one response to each question.

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not Important at All
11. Keeping time open for having fun	<input type="radio"/>				
12. Living simply/having few material desires	<input type="radio"/>				
13. Helping a friend	<input type="radio"/>				
14. Spending only on necessities	<input type="radio"/>				

The following questions ask you to reflect on your state of emotion and health, and your perception of your native country. Please note that these questions have slightly different anchors. Questions 15 and 16 ask about frequency of feeling nervous and being a happy person respectively, and their scale of responses ranges from "always" to "never". For Question 17, which asks about experience with others influencing your behaviors, the scale ranges from "Yes, always" to "No, never". For Question 18 that asks about your state of health, the scale ranges from "very good" to "very poor". Question 19 asks about your perception of your native country, the scale of response ranges from "very proud" to "not proud at all". Please choose one and only one response to each question, and answer these questions to your best knowledge.

15. How often do you feel nervous or tense?

Always      Usually      Sometimes      Seldom      Never

16. Are you a happy person?

Always      Usually      Sometimes      Seldom      Never

17. Do other people or circumstances ever prevent you from doing what you really want to?

Yes, always    Yes, usually    Sometimes    No, seldom    No, never

18. All in all, how would you describe your state of health these days?

Very Good    Good      Fair      Poor      Very Poor

19. How proud are you to be a citizen of your country?

Very Proud    Fairly Proud    Somewhat Proud    Not Very Proud    Not Proud at All

The following question asks your perspective of student-faculty relations in colleges and universities. Please answer the question to your best knowledge. Please note that the question has a slightly different anchor. The scale of responses range from "never" to "always".

20. In your experience, how often are college students afraid to contradict their faculty?

Never      Seldom      Sometimes      Usually      Always

The following questions provide different beliefs about aspects of college and university student life. To what extent do you agree or disagree with each of the following statements? Please note that these questions have slightly different anchors. The scale of responses for questions below range from "Strongly agree" to "Strongly disagree". Please choose one and only one response to each question.

	Strongly Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Strongly Disagree
21. An instructor can be good without giving a precise answer to every question a student raises.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Consistent hard work is the surest way to achieve academic success.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. The college or university should have multiple sources to provide students directions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. College or university students should not break rules, not even when breaking the rule would be ultimately bring the greater good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**APPENDIX E**

**SCORING RUBRIC FOR EXPERT REVIEW**

<b>Instrument Review Rubric</b>		
	<b>Reviewing Criterion: Clarity</b>	<b>Reviewing Criterion: Relevancy</b>
<b>Item with Corresponding Construct to Measure</b>	0-very confusing 1-confusing 2- clear	1-irrelevant 2-little relevant 2-relevant
Item 1-Individualism		
Item 2-Power Distance		
Item 3-Masculinity		
Item 4-Individualism		
Item 5-Masculinity		
Item 6-Individualism		
Item 7-Power Distance		
Item 8-Masculinity		
Item 9-Individualism		
Item 10-Masculinity		
Item 11-Indulgence v.s. Restraint		
Item 12-Indulgence v.s. Restraint		
Item 13-Long-term Orientation		
Item 14-Long-term Orientation		
Item 15-Uncertainty Avoidance		
Item 16-Indulgence v.s. Restraint		
Item 17-Indulgence v.s. Restraint		
Item 18-Uncertainty Avoidance		
Item 19-long-term Orientation		
Item 20-Power Distance		
Item 21-Uncertainty Avoidance		
Item 22-Long-term Orientation		
Item 23-Power Distance		
Item 24-Uncertainty Avoidance		
Item 25-Consistency of Communication with Other Cultural Groups		
Item 26- Interactiveness of Communication with Other Cultural Groups		

## APPENDIX F

### PILOT TEST FEEDBACK FORM

Please review the items above, check the box to indicate the level of difficulty in answering each item. Leave an explanation on why you find the item difficult in the comment section

	How difficult is it to answer the item?			Comments
	Very Difficult	Somewhat Difficult	Not Difficult	
Item 1			•	
Item 2			•	
Item 3			•	
Item 4			•	
Item 5			•	
Item 6			•	
Item 7			•	
Item 8			•	
Item 9			•	
Item 10			•	
Item 11			•	
Item 12			•	
Item 13			•	
Item 14			•	
Item 15			•	
Item 16			•	
Item 17			•	
Item 18			•	
Item 19			•	
Item 20			•	
Item 21			•	
Item 22			•	
Item 23			•	
Item 24			•	
Item 25		•		
Item 26		•		

**APPENDIX G**  
**LETTER OF SUPPORT FROM**  
**UO OFFICE OF ENROLLMENT AND MANAGEMENT**



March 16, 2016

To Whom It Concerns:

The University of Oregon Office of Enrollment Management (hereafter "the Office") acknowledges its support for the dissertation study of Yue Shen (Hereafter "the Researcher"), Ph.D. Candidate in Educational Methodology, Policy and Leadership, University of Oregon.

Upon receiving approval of Institutional Research Board at University of Oregon, and documented consents of individual UO students on doing so, the Office will provide the Researcher following data on students who consented: Data include high school GPA, English language proficiency scores, primary source of funding, accumulative GPA, most recent Term GPA, and retention records. For purposes of FERPA, consent documents will be provided to the Office along with samples of the survey instrument for review prior to the release of data.

Sincerely,

A handwritten signature in blue ink, appearing to read 'R. Thompson'.

Roger Thompson  
Vice President for Enrollment Management  
[vpem@uoregon.edu](mailto:vpem@uoregon.edu)

Enrollment Management  
463 Oregon Hall, 1203 University of Oregon, Eugene, OR 97403-1203  
541-346-9386 | FAX 541-346-9391 [www.enroll.uoregon.edu](http://www.enroll.uoregon.edu)

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**APPENDIX H**  
**RECRUITING MATERIALS**

**Recruiting Email Message: International Participants**

Subject: Invitation to Participate in Study about UO International Student  
Dear International Ducks,

You are invited to participate in a research study about international student perception and experience at UO. As a participant, you will complete a survey for about 7-10 minutes. In the survey, you will be asked about your perceptions of an ideal learning environment in the university, your experience at UO, and to give the study access to some of your demographic and academic records at UO.

As an international undergraduate student at UO, your participation in the survey is critical in helping the university better understand the unique needs of you and your peers, other international students. Your responses are of great value to ensure that the university to serve you and your peers with effectiveness and efficiency, and to ultimately help increase the knowledge about international student success in US higher education.

To participate in the study, you must be enrolled in a bachelor's degree program at UO, and hold a valid F-1 visa or current I-20 issued by US Department of Homeland Security. You must also be at least 18 years old in order to give consent in participating in the study.

As the surveyor and an international Duck herself, the researcher is passionate about finding out the mechanism of success to international student academic success at the University of Oregon. She would like to express her gratitude in having your help in helping friends and fellow international students by participating in the study. To say thank you, you will receive a 10dollar electronic gift card after you complete the survey; more importantly, you will proudly know that you have contributed to the success of all international Ducks in a meaningful way.

Thank you so much for participating in the meaningful study!

Click here for consent form of the study, and proceed to take the survey if you want to. [Insert the Survey Link]

Sincerely,

## **Recruiting Email Message: Domestic Participants**

Subject: Invitation to Participate in Study about UO International Student

Dear UO Students,

You are invited to participate in a research study about international student perception and experience at UO. As a participant, you will complete a survey for about 7-10minutes. In the surveys, you will be asked about your perceptions of an ideal learning environment in the university.

As a domestic undergraduate student at UO, your participation in the survey is critical in helping the university better understand the unique needs of your international peers, by comparing their experiences to those of your own. Your responses are of great value to ensure that the university to serve you and your international peers with effectiveness and efficiency, and to ultimately help increase the knowledge about international student success in US higher education.

To participate in the study, you must be domestic students of US, and enrolled in a bachelor's degree program at UO. You must also be at least 18 years old in order to give consent in participating in the study.

As the surveyor and an international Duck herself, the researcher is passionate about finding out mechanisms of success, particularly for international students, at the University of Oregon. To say thank you, you will receive a 10dollar electronic gift card after you complete the survey; more importantly, you will proudly know that you have contributed to the success of all international Ducks in a meaningful way.

Thank you so much for participating in the meaningful study!

Click [here](#) for consent form of the study, and proceed to take the survey if you want to. [Insert the Survey Link]

Sincerely,

## **Recruiting Follow-up Email Message: International Participants**

Subject: Reminder: UO International Student Survey Study Dear International Ducks,

Last week we sent you an email asking for your participation in the UO international student study by responding to a survey. In the surveys, you will be asked about your perceptions of an ideal learning environment in the university, your experience at UO, and to give the study access to some of your demographic and academic records at UO.

As an international undergraduate student at UO, your response will help the university better understand the unique needs of you and your international peers and modify the services and support accordingly.

The survey is short and should take you 7-10 minutes to complete. If you have completed the survey, I'd like to say thank you for helping yourself and your fellow international students. If you haven't completed the survey, I'd like to invite you to follow the embedded link below and complete it.

To participate in the study, you must be enrolled in a bachelor's degree program at UO, and hold a valid F-1 visa or current I-20 issued by US Department of Homeland Security. You must also be at least 18 years old in order to give consent in participating in the study.

Upon your completion of the survey, you will receive a 10-dollar electronic gift card after you complete the survey each time; we thank you for helping your fellow international students in achieving success. Please know that your unique insight is a great value in helping the university serve you and your international peers.

[Insert the Survey Link]

Sincerely,

## **Recruiting Follow-up Email Message: Domestic Participants**

Subject: Reminder: UO International Student Survey Study

Dear UO Students,

Last week we sent you an email asking for your participation in the UO international student study by responding to a survey. In the surveys, you will be asked about your perceptions of an ideal learning environment in a university, and your experience at UO.

As domestic US students at UO, your response will help the university better understand the unique needs of you and your international peers and modify the services and support accordingly.

The survey is short and should take you 7-10 minutes to complete. If you have completed the survey, I'd like to say thank you for helping yourself and your fellow international students. If you haven't completed the survey, I'd like to invite you to follow the embedded link below and complete it.

To participate in the study, you must be enrolled in a bachelor's degree program at UO, and hold a valid F-1 visa or current I-20 issued by US Department of Homeland Security. You must also be at least 18 years old in order to give consent in participating in the study.

Upon your completion of the survey, you will receive a 10 dollar electronic gift card after you complete the survey each time; we thank you for helping your fellow international students in achieving success. Please know that your unique insight is a great value in helping the university serve you and your international peers.

[Insert the Survey Link]

Sincerely,

## **Final Email Reminder: International Participants**

Subject: Don't Miss Out: Participate in UO International Student Success Study

Dear international students,

In recent weeks, you have been invited to participate in a study about international student success at the University of Oregon, to respond to a survey about your ideal higher education experience. We plan to start analyzing these data later this month, so we hope that you can complete the survey before end of Week 9 (November 25th, 2016).

It is critical for international students at UO to express our own cultural beliefs and values in higher education, so that the rest of the campus community can better support us in pursuing success at UO. Participants of the study have appreciated such opportunity to reflect on their own culture in the context of higher education.

Here is the link to participate in the survey study [Insert Link]. Upon completing the survey, we will send you a \$10 Amazon e-gift card, in appreciation for your effort.

This is the last reminder we will be sending you to participate in the said study. To learn more about the study, or any question regarding participation, please contact the principal researcher,

Yue "Adam" Shen, at [yshen4@uoregon.edu](mailto:yshen4@uoregon.edu).

Thank you so much,

## **Final Email Reminder: Domestic Participants**

Subject: Don't Miss Out: Participate in Study about UO International Student Success.

Dear UO students,

In recent weeks, you have been invited to participate in a study about international student success at the University of Oregon, to respond to a survey about your ideal higher education experience. We plan to start analyzing these data later this month, so we hope that you can complete the survey before end of Week 9 (November 25th, 2016).

It is critical for students, including international students, at UO to express our own cultural beliefs and values in higher education, so that the rest of the campus community can better support us in pursuing success at UO. Participants of the study have appreciated such opportunity to reflect on their own culture in the context of higher education.

Here is the link to participate in the survey study [Insert Link]. Upon completing the survey, we will send you a \$10 Amazon e-gift card, in appreciation for your effort.

This is the last reminder we will be sending you to participate in the said study. To learn more about the study, or any question regarding participation, please contact the principal researcher, Yue "Adam" Shen, at [yshen4@uoregon.edu](mailto:yshen4@uoregon.edu).

Thank you so much,

## **Recruiting Messages for Online Websites and Social Network Site**

Call for International Students: Wonder What Culture has to do with your success at UO?  
Participate in the study that looks at your unique cultural strengths!

To participate in the study, you must be enrolled in a bachelor's degree program at UO, and hold a valid F-1 visa or current I-20 issued by US Department of Homeland Security. You must also be at least 18 years old in order to give consent in participating in the study.

Click the following for a brief introduction of the study, how to participate and all the incentives!  
Insert links.

## **Recruiting Flyer Draft (Image-removed)**

Call for International Students: Wonder What Culture has to do with your success at UO?  
Participate in the study that looks at your unique cultural strengths!

To participate in the study, you must be enrolled in a bachelor's degree program at UO, and hold a valid F-1 visa or current I-20 issued by US Department of Homeland Security. You must also be at least 18 years old in order to give consent in participating in the study.

Click the following for a brief introduction of the study, how to participate and all the incentives!

Insert Link and QR Code of the Link.

## **Oral Recruiting Message Prompt**

Hi [Name of Group/Organization/Event] members/attendees/, thank you for allowing me to introduce/I want to give a shout out about a study on UO international students. If you are an undergraduate F-1 international student, and are curious about What Culture has to do with your success at UO, Participate in the study by responding to a survey! The survey asks about your attitudes and beliefs about higher education, and completing the survey, and your responses will help the University to improve your learning environment! You will receive a thank-you gift card of \$10 dollars!

Please check your UO email inbox for an email invitation, or grab a flyer here to learn about how to participate!

## APPENDIX I

### LETTER OF SUPPORT FROM

### UO OFFICE OF INTERNATIONAL STUDENT AND SCHOLAR SERVICES



UNIVERSITY OF OREGON  
International Affairs

March 18, 2016

To Whom It May Concern:

The University of Oregon Office of International Affairs (hereafter “the Office”) acknowledges its support for the dissertation study of Yue Shen (Hereafter “the Researcher”), Ph.D. Candidate in Educational Methodology, Policy and Leadership, University of Oregon.

Upon receiving approval from Institutional Research Board at the University of Oregon, the Office will email UO international students for the dissertation study, and provide promotion venues within its existing operation for the purpose of participant recruitment.

Best regards,

Abe Schafermeyer  
Director, International Student & Scholar Services  
Oregon Hall  
Eugene, OR 97403-5209  
T 541 346-1215 F 541 346-1232  
abe@uoregon.edu

INTERNATIONAL AFFAIRS

5209 University of Oregon, Eugene OR 97403-5209 USA (541) 346-3206 FAX (541) 346-1232 <http://international.uoregon.edu>

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## APPENDIX J

### FACTOR LOADING AND FACTOR SCORE COMPUTATION

In preparation for analyses conducted for RQ2, I calculated factor scores of F1-4 for the whole sample in the measurement model. Table 2 presents factor score weights of items on respective factors, estimated in the previous CFA.

Table 2  
Factor Score Weights

	F1	F2	F3	F4
V1	.04			
V2	.05			
V3	.08			
V4	.12			
V5	.09			
V6	.11			
V7	.08			
V8	.04			
V10	.09			
V12		.29		
V14		.45		
V15			.08	
V16			-.22	
V17			.07	
V18			-.15	
V19				.32
V23	.07			
V24				.02

In calculating Factor scores for each subject in the sample, I chose a simplified regression method (Estabrook & Neale, 2013; Thurston, 1934). For each subject, measures of items loaded on one factor were multiplied with their corresponding factor score weights (presented in Table 2). The sum of all multiplications were the subject's score on the factor in context. The following formula were calculations for each factor score,  $Z_{F1-F4}$ , where

$$Z_{F1} = L_{V1}V1 + L_{V2}V2 + L_{V3}V3 + L_{V4}V4 + L_{V5}V5 + L_{V6}V6 + L_{V7}V7 + L_{V8}V8 + L_{V10}V10 + L_{V23}V23$$

$$Z_{F2} = L_{V12}V12 + L_{V14}V14$$

$$Z_{F3} = L_{V15}V15 + L_{V16}V16 + L_{V17}V17 + L_{V18}V18$$

$$Z_{F4} = L_{V19}V19 + L_{V24}V24$$

Hypothetically, one subject's measures on items were

V1=1, V2 = 2, V3=3, V4=4, V5=5, V6= 5, V7= 4, V8=3, V10=2, V12=1, V14=1,  
V15=2, V16=3, V17=4, V18=5, V19=5, V23=4, V24=3.

Referencing factors score weights in Table 2, I calculated the factor scores for this subject to be:

$$\begin{aligned} Z_{F1} &= .04 \times 1 + .05 \times 2 + .08 \times 3 + .12 \times 4 + .09 \times 5 + .11 \times 5 + .08 \times 4 + .04 \times 3 + .09 \times 2 + .07 \times 4 \\ &= 2.76 \end{aligned}$$

$$Z_{F2} = .29 \times 1 + .45 \times 1 = .74$$

$$Z_{F3} = .08 \times 2 - .22 \times 3 + .07 \times 4 - .15 \times 5 = -.97$$

$$Z_{F4} = .32 \times 5 + .02 \times 3 = 1.66$$

After calculation of factor scores for the sample, I recoded the factor scores to accommodate the requirement of the program (SAS), in which I would conduct analyses addressing RQ2 and RQ3. For each factor, I first standardized the scores in the sample, then recoded each subject's score by the whole number of standard deviation it was above the minimum in the sample. This recoding method preserved the variance of each factor score. After recoding, factor scores in the sample were on the following scale:  $Z_{F1\text{recoded}}$  (1–4),  $Z_{F2\text{recoded}}$  (1–5),  $Z_{F3\text{recoded}}$  (1–6),  $Z_{F4\text{recoded}}$  (1–4).

## APPENDIX K

### REFERENCES CITED IN CHAPTER II

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