

ACCULTURATION STRATEGY, ACCULTURATIVE STRESS AND ACADEMIC
PERFORMANCE IN FIRST-YEAR CHINESE INTERNATIONAL STUDENTS AT AN
AMERICAN COLLEGE

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Abstract

Chinese nationals represent the largest subgroup of international students in America today. Consisting of over 30% of all international students at American colleges and universities, this large and growing student body represents a significant source of diversity, cultural exchange and enrollment. With the expansion of this distinct student population, institutions of higher education have recognized an increasing responsibility to understand the specific suite of challenges these students face during their cultural and linguistic transition. The purpose of this research is threefold: to assess the most common acculturation strategy in first-year Chinese international students; to investigate the association of acculturative stress to academic performance, and to explore the relationships of a variety of demographic characteristics with acculturation strategy, acculturative stress, and first-year GPA. This study is the first of its kind to combine demographic data with the results of Bai's Acculturative Stress Scale for Chinese Student (ASSCS) and Barry's East Asian Acculturation Measure (EAAM) in first-year Chinese international students at an American College. Its results confirm significant correlations between students' acculturation strategy, acculturative stress levels, and first-year GPA. In addition, a select group of demographic characteristics were analyzed and found to be significantly correlated with acculturative stress and/or academic performance, including: family income level, parental education level, fluency in multiple Chinese dialects, prior visits to the U.S., national origin of roommates, number of close American friends, and high school GPA.

Keywords: academic performance, acculturation, acculturation strategy, acculturative stress, Chinese international students, cultural distance, intercultural migration.

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Chapter 1: Introduction

Statement of the Problem

International student enrollment has become an increasingly significant component of American colleges and universities, and represents an important source of cultural diversity, academic exchange, cross-cultural interaction, and enrollment revenue within American institutions of higher education (Bertlett & Fischer, 2011; I.I.E. Open Doors Report, 2015; Stevens, 2012; Sullivan & Kashubeck-West, 2015; Yakunina et al., 2012; Zhang & Goodson, 2011). According to a joint 2015 report by the Institute of International Education and the U.S. Department of State's Bureau of Educational and Cultural Affairs, the United States stands as the world's largest host country for international students, accounting for 974,926 students, or nearly 5% of total U.S. graduate and undergraduate enrollments in the 2014-15 year (I.I.E. Open Doors Report, 2015). Representing a 10% increase over 2013-14, international students as a whole contributed \$30.8 billion to the U.S. economy in 2014-15 (U.S. Department of Commerce, 2015).

The countries of China and India accounted for nearly 67% of the overall international student growth rate in 2014-15, with the highest growth sector being Chinese undergraduate and graduate students. In terms of total student numbers, China and India account for 45% of all international student enrollments in the U.S (I.I.E. Open Doors Report, 2015).

In the 2014-2015 academic year there were 304,040 international students from China actively enrolled at US colleges and universities; an 11% increase over the previous year. Chinese international students now comprise over 30% of the total international student enrollments from all places of origin (I.I.E. Open Doors Report, 2015). Since 2007/08, the number of students coming from China to the US for study has been increasing at a rate of

over 11% per year, with China now representing the leading country of origin for international students in the US for the 6th year in a row (I.I.E. Open Doors Report, 2015).

In a 2011 joint article between the New York Times and the Chronicle of Higher Education, Tom Bartlett and Karin Fischer point to this rapid growth in Chinese student enrollments as a welcome revenue stream for many institutions, yet identify numerous complexities, largely rooted in linguistic and cultural differences, associated with serving this particular international student cohort (Bartlett & Fischer, 2011). This perspective is echoed in Scott Stevens's 2012 article for NAFSA: Association of International Educators, which contrasts the financial and global diversity benefits of hosting Chinese internationals with language and social engagement barriers which often lead to poor academic performance in this student cohort (Stevens, 2012).

Such barriers to achievement have resulted in very real consequences for both Chinese international students, and the institutions that serve them. In 2014 the WoleRen Education Research Center issued a report on 1,657 Chinese international students that were expelled in the 2012-2013 academic year, citing low academic achievement (62.1% in a sampled group of 515) and academic dishonesty (21.4% in a sampled group of 515) as the predominant reasons for student dismissal (WoleRen, 2014). WoleRen's estimates of the total number of Chinese international students expelled in the 2014 academic year are upwards of 8,000 students.

Previous research into the behaviors and attitudes of Chinese international students has identified acculturative challenges with regard to language comprehension and fluency (Bartlett & Fischer, 2011; Chan, 1999; He, Lopez, & Leigh, 2012; Jin & Liu 2014; Lowinger et al., 2014; Lueck & Wilson, 2010; Ma, 2014; Stevens, 2012; Wicks, 1996), learning style preference (Chan, 1999; Li, 2003; Liu, 2002), dissimilar attitudes toward learning (Li, 2003; Liu, 2002; Martin, 1994), problems with classroom engagement (Bartlett & Fischer, 2011,

Liu, 2002; Stevens, 2012), procrastination (Lowinger et al., 2014), self-efficacy (Kim, Omizo, & Michael, 2005; Lin & Betz, 2009), and complications related to academic integrity (Bartlett & Fischer, 2011; Rawwas et al., 2004; Song-Turner, 2008; Stevens, 2012). These findings are bolstered by the significant body of research in the fields of cross-cultural psychology, education, cultural anthropology and public health, which indicates that language barriers, along with cultural and behavioral differences present considerable acculturative challenges to many international immigrant, refugee, sojourner, and culturally non-dominant indigenous populations (Berry et al., 1987; Berry & Kim, 1988; Kim et al., 2005; Ward & Rana-Deuba, 1999). Professor John Berry's seminal works into the psychosocial effects of intercultural transition and acculturation (Berry, 1974, 1989, 1990, 1995, 1997) built upon earlier work by Theodore Graves (1967) and Robert Redfield, Ralph Linton, and Melville Herskovits (1936) to identify four major acculturation strategies within individuals and populations: assimilation, integration, separation, and marginalization. Berry's model for exploring the acculturative process has been widely used in research spanning multiple academic disciplines, and has provided a fundamental theoretical framework for the study of acculturation psychology (Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999). Berry's four acculturation strategies have been shown in various populations to correspond with predictable levels of psychosocial stress (Berry, Kim, Mindhe, & Mok, 1987; Ward & Rana-Deuba, 1999).

Known collectively as *acculturative stress*, the psychological, emotional and sociological stresses associated with acculturative challenges have been linked to negative impacts on cognitive function (Kim & Omizo, 2005), inter-group socialization (Triandis, 1964, 1989, 1995, 2012), life satisfaction, self-efficacy and self-esteem (Kim & Omizo, 2005), health and health-related behaviors (Abraido-Lanza et al., 2006; Berry, 1998; Salant & Lauderdale, 2003; Shelly et al., 2004), and general psychological wellbeing (Berry et al.,

1987; He, Lopez, & Leigh, 2012; Ho & Crookall, 1995; Lueck & Wilson, 2010; Kim et al., 2006; Li, 2003; Lu, 1990; Ma, 2014; Stevens, 2012; Triandis, 1964, 1989, 1995, 2012; Vinuesa, Thoman, & Suris, 2015; Wei et al., 2007).

While acculturative stress has been shown to have significant impacts on general functioning and wellbeing within many members of intercultural migrant groups (Berry, 1980, 1990, 1994, 1995; Sullivan & Kashubeck-West, 2015; Stone, Feinstein, & Ward, 1990; Ward & Rana-Deuba, 1999) there exists a surprising gap in the literature with regard to direct correlations between acculturation strategy, acculturative stress and academic performance in first-year Chinese international students at American institutions of higher education. With over 300,000 enrollees in 2015, and projections of continuing double digit growth into the coming decade (IIE Open Doors Report, 2015) international students from China are likely to remain the dominant international student subgroup at American colleges and universities. By developing a clear understanding of the origins and academic impacts of acculturative stress in first-year Chinese international students, we are positioned to provide recommendations for acculturation strategies designed to ease the transition of these students into American institutions of higher education.

Significance of the Study

Practical Significance

According to the Institute of International Education's 2015 Open Doors report on international student enrollment trends, the first decade of the 21st century has been marked by a steady and dramatic rise in the number of Chinese students matriculating into American colleges and universities (IIE Open Doors Report, 2015). At 31% of all international students currently enrolled at American institutions of higher education, Chinese nationals now represent the largest international student subgroup.

With over 300,000 Chinese nationals now studying in American colleges and universities, retention, academic achievement, and persistence to graduation of these students have become primary shared goals of both the institution of higher education and the international students they serve (Bartlett & Fischer, 2011; Hanover Research, 2010; Ma, 2014; Stevens, 2012).

The objective of clearly identifying first-year Chinese international students' acculturation strategy, level of acculturative stress, and the potential impact on academic performance is highly pragmatic, and is directly related to considerations of program recruitment and delivery costs, student support initiatives, student retention, persistence, and the overall quality and value of the student experience. Additionally, specific acculturative barriers which place Chinese undergraduates at an academic disadvantage, along with unfamiliar institutional expectations may disproportionately influence Chinese students to participate in overtly desperate measures such as cheating, plagiarism and other forms of academic dishonesty (Bartlett & Fischer, 2011; Ma, 2014). This consideration in particular has received the attentions of various scholars who have identified breaches in academic integrity as being particularly pervasive within Chinese undergraduates at American institutions of higher education (Bartlett & Fischer, 2011; Li, 2003; Ma, 2014; Rawwas et al., 2004; Song-Turner, 2008).

At Cambridge College, the average cost of recruitment for local students, including a portion of marketing, advertising, admissions staff salary, outreach initiatives, registration and data entry is calculated at \$2,800 per student matriculated. Because of the various start-up costs of establishing international articulations and recruitment initiatives; including the additional costs of travel, hosting of foreign officials, academic assessment and translation costs, the recruitment cost per international student is adjusted to \$4,300 per student matriculated. While specific costs will vary by institution, it is generally recognized that

establishing international markets in higher education is, per capita, more expensive than recruiting at a local or regional level (Commission on International Student Recruitment, 2013; Hanover Research, 2010). It is therefore critical that international students are retained, make satisfactory academic progress, and receive thoughtful and informed support during their programs of study at American institutions of higher education.

Research and Theoretical Significance

Studies of acculturation and acculturative stress within the fields of cross-cultural psychology, education, cultural anthropology, and public health have confirmed that international sojourners, immigrants and refugees experience distinct stressors associated with transitioning between their culture of origin, and a novel host culture (Berry, 1980, 1990, 1994, 1995, 1997, Sullivan & Kashubeck-West, 2015; Stone, Feinstein, & Ward, 1990; Ward & Rana-Deuba, 1999). These stressors include but are not limited to linguistic barriers, differences in cultural practices and expectations, difficulties in engagement and integration with the host culture, and feelings of loneliness, isolation and/or discrimination (Berry, 1994, 1995, 1997; Ward & Kennedy, 1999). Furthermore, acculturative stress has been identified as a significant predictor of anxiety and depression, which in turn often negatively impact cognitive performance (Berry, 1980, 1990, 1994, 1995; Sullivan & Kashubeck-West, 2015; Stone, Feinstein, & Ward, 1990; Ward & Rana-Deuba, 1999). Much of this research has implemented a theoretical framework developed by cross-cultural psychologist John Berry, who is largely regarded as a founding theoretical architect of acculturation psychology (Kang, 2004; Ward & Kennedy, 1999), and whose model of acculturation will function as a theoretical framework to this study.

Researchers agree that there is a need for expanded understanding of the cultural and linguistic differences that may lead to acculturative stress and barriers to achievement for Chinese students studying at Western institutions of higher education (Chan, 1999; Duff,

2001, Ho & Crookall, 1995; Hsu, 1985; Li, 2003; Lu, 1990). To assess the adoption of specific acculturation strategies and the manifestations of adaptive challenges as acculturative stress, it is necessary to develop an informed understanding of how these students experience the intercultural transition process and what, if any, is the impact on academic performance. Furthermore, because no previous studies have focused on acculturation, acculturative stress and academic performance exclusively in first-year Chinese international students, this study represents an important addition to the theoretical and research literature.

While numerous scales exist to measure acculturation and acculturative stress (Celenk & Van de Vijver, 2011; Rudmin, 2003, 2009), most, for the purposes of this study, are designed for overly broad populations: “Asian Self-Identity Acculturation Scale” (Suinn, Ahuna, & Khoo, 1992), or are either culturally non-specific: “International Students” (Sandhu and Asrabadi’s Acculturative Stress Scale for International Students [Sandhu & Asrabadi, 1998]), or specific to other cultural groups, such as Jibeen and Khalid’s Multidimensional Acculturative Stress Scale (MASS), developed for Pakistani immigrants (Jibeen & Khalid, 2010). Although some of these tools may be adapted for use across cultural-linguistic groups, results may be confounded when an assessment tool which is developed for one target population is altered, however carefully, for use with another (Creswell, 2009). Barry’s East Asian Acculturation Measure (2001) is appropriately culturally specific, was developed for use with Berry’s acculturation strategies model, has been validated and found reliable in its application, and is therefore employed within the current study for these reasons.

One acculturative stress measurement scale has recently emerged which was specifically designed for use with Chinese international students. The Acculturative Stress Scale for Chinese College Students in the United States (ASSCS) was developed and validated in 2012 by Jieru Bai to measure five dimensions of acculturative stress in this

student cohort: Language Insufficiency; Social Isolation; Perceived Discrimination; Academic Pressure, and Guilt Toward Family (Bai, 2012, 2015). This scale is notable for its focus on the appropriate population of this study, and for having been accurately translated into Mandarin to protect against language bias (Bai, 2012, 2015).

While this tool now exists for use within the research community, it has not been previously applied to any study linking acculturation strategy, acculturative stress and academic performance in first-year Chinese students at American Colleges and Universities. This study will therefore be the first to correlate acculturation strategy, as defined and measured by Berry's Acculturative Strategy model, with level of acculturative stress, as measured by Bai's ASSCS scale, with academic performance, as measured by GPA, in first-year Chinese International Students.

Positionality Statement

As the undergraduate dean of a medium-sized New England College with university program partners in Beijing and Shandong Province, China, I have witnessed firsthand the growing number of Chinese students enrolling at our institution, and have observed with keen interest the transition process for these students. In concert with this enrollment trend, many of our faculty members have reported a pattern of insufficient classroom participation, substandard intercultural socialization, and language-related academic challenges in their first-year Chinese international students.

While anecdotal reports of student acculturative behaviors and challenges serve as a starting point of discussion at the faculty-administration level, a data-driven understanding of this process is necessary. My academic and teaching background in vertebrate ethology (animal behavior) leads me to be particularly interested in developing data which are either supportive or contradictive of common assumptions. Without such data, our discussions

simply exist in the realm of conjecture and supposition, and no data-informed solutions are available to us.

Although our expanding experience with this particular student body lends some narrative to the process, I realize that it is equally important that I am sensitive to the potential for researcher bias; that I not allow unfounded preconceptions to influence the direction or interpretation of my inquiry. To this end, my studies of animal behavior have proved markedly useful in fostering both disciplined objectivity, and the intellectual flexibility to allow myself to be surprised by the data. This background is particularly valuable to me in identifying and contextualizing behavioral repertoires, and questioning my own personal assumptions should they be challenged by statistical analysis. It is through this combination of scientific curiosity and a personal dedication to better serve and support both our Chinese international students and our faculty that I have undertaken this research.

Research Questions

The principal objectives of this research are to assess the acculturation strategies of first-year Chinese international students, correlate these strategies with levels of acculturative stress, and compare these findings with student academic performance. Its broader purpose is to provide a linguistic and cultural/psychosocial context from which these strategies and stresses emerge, clarifying the foundations of Chinese student motivations, attitudes and behaviors within the American institution of higher education. The three key research questions to be examined in this research include:

- I. What is the most common acculturation strategy adopted by first-year Chinese international students at an American college?
- II. To what extent does acculturative stress relate to academic performance in first-term Chinese international students?

- III. To what extent do the number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, parent's level of education, household income, frequency of family communication, number of American friends, and phase (time spent in the US) correspond with acculturative stress and GPA in first-year Chinese international students at an American college?

Theoretical Framework

The theoretical framework of this study serves to guide and contextualize the investigation of how acculturation strategy and acculturative stress correlate with academic performance in first-year Chinese students at American colleges and universities.

Recognizing the inherent connections between cultural, linguistic and psychosocial experiences within individuals, and appreciating how these variables may both directly and indirectly influence acculturation strategy, acculturative stress, and academic performance is fundamental to this work. To this end, Acculturation Theory, which considers these elements to be at the cornerstone of intercultural adaptation, is central to this study.

Acculturation and Acculturation Theory

As presented through the seminal works of John Berry (Berry, 1974, 1990, 1997, 2005; Berry & Annis, 1974; Berry et al., 1987; Berry et al., 1989), Leopoldo Cabassa (2008), Graves (1967), and Robert Redfield, Ralph Linton and Melville Herskovits (1939), acculturation is characterized as the psychological, cultural and behavioral changes that occur when individuals or groups from different cultural contexts engage in prolonged, first-hand contact. Acculturation as a process may be viewed in both a collective context within distinct groups, or in an individual context of personal change (Berry, 1997).

Acculturative change often includes multiple dimensions including language (Lowinger et al., 2014; Salant & Lauderdale, 2003; Sandhu & Asrabadi, 1998; Sullivan & Kashubeck-West, 2015), attitudes (Ward & Rana-Deuba, 1999), behaviors and cultural

practices (Thoman & Suris, 2004), personal experiences, economic status and adjustments in self-identity (Hsu, 1985). Berry's 1997 article for the International Association of Applied Psychology, which has been cited in the academic literature well over 5,000 times, provides a comprehensive framework for the study of bilateral acculturation; identifying both group and individual-level variables that impact this process (Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Represented in figure 1, Berry presents a flow chart of inputs, outcomes and moderating factors designed to guide acculturation research, with the left side of the diagram isolating group- or cultural-level phenomena. Berry considers these variables, labeled "Group Level Variables" to be primarily situational in nature, meaning they are largely dependent on the interplay between individuals within a group. The right-hand column, labeled "Individual Level Variables" consist of individual-level factors which are deemed to influence the acculturation process at a singular degree (Berry, 1997). While a number of these variables exist as either group- or individual-level factors in Berry's diagram, some, like cultural distance and acculturation strategy, may be viewed simultaneously as both a group- and individual-level variable (Berry, 1997).

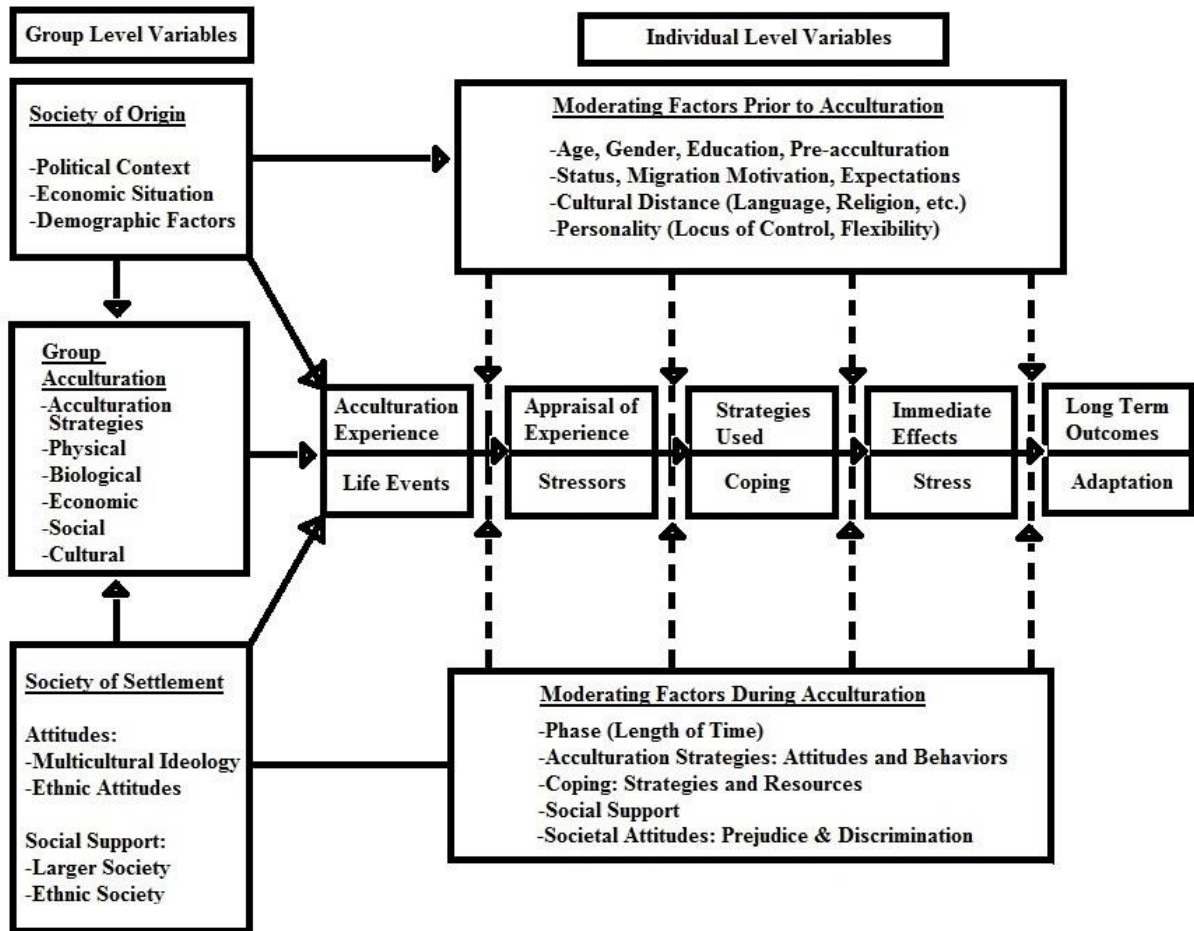


Figure 1. Berry's framework for acculturation research (Berry, 1997).

The right-hand upper and lower blocks, entitled “Moderating Factors Prior to Acculturation” (upper right) and “Moderating Factors During Acculturation” represent the various individual-level, pre-existing experiences and conditions before the migration/intercultural contact, and those moderating factors which are present during intercultural contact. Both sets of moderating factors have been shown to influence the rate, direction, and magnitude of individual acculturation (Ward & Rana-Dueba, 1999).

The central squares within the diagram represent the flow of the acculturation process within individuals over time. This progression consists of initial experience within the host/dominant culture, assessment of that experience (and the related stresses), followed by the development of coping strategies, assessment of the efficacy of those strategies, and

subsequent re-calibration and adaptation (long-term outcomes) (Berry, 1997). It has been noted by psychologist Colleen Ward (1996) that the progression which constitutes the central flow of the acculturative process is highly variable within individuals, and is dependent on influential inputs and conditions that exist both prior to and during acculturation. Berry emphasizes the primacy of cultural context and the influence of cultural distance in this model, and asserts that a valid study of acculturation in any group must first begin with an analysis of both the culture of origin of the group, and the culture of settlement (Berry, 1997). Termed *cultural distance* by Berry (1989, 1990), the degree of differences in language, cultural practices and beliefs between the culture of origin and the culture of settlement is a prime determinant of the acculturation strategy an individual adopts, and is predictive of the level of acculturative stress an individual will experience (Berry, 1989, 1990).

Within this model, Berry (1997) prescribes a procedure which includes the following steps:

1. Collection of relevant group-level sociocultural and linguistic information on both the culture of origin and the host culture in order to determine the degree of cultural distance between the two.
2. Identification of acculturative stressors and stress-related variables including individual-level data within the acculturating sample, including age, gender, education level, economic status, and other factors indicated by the research literature.
3. Evaluation of the impact of the acculturative process/acculturative stress on the variable(s) to be researched.

While Berry suggests that ideally, studies utilizing this theoretical model would gather data on each of the group-level and individual-level variables and their moderators, he also concedes that data collection on some variables such as physical/biological states and individual personality factors may be impractical and in some cases prohibitive (Berry,

1997). This position is supported by Bai (2015), Chun (2003), Lazarus (1999), and Triandis (1997) who assert that the primary and most essential group-level variables within the framework include sociocultural factors of the society of origin and the society of settlement (i.e., collectivist vs. individualistic; heterogeneous vs. pluralistic; communist vs. democratic), and the individual-level variables of age, gender, income, education level, and factors contributing to cultural distance such as language and cultural practices/beliefs. Bai (2015) and Berry (1997) further assert that the moderating factors of primary interest within the model include phase (length of time), acculturation strategy, social supports, and societal attitudes including prejudice and discrimination.

Acculturation Strategies

In Berry's early research article "Psychological aspects of cultural pluralism" (1974) we see the initial formulation of what was to become his quadrant model of acculturation *strategies* (Berry, 1989, 1997). Acculturation strategy refers to the adaptive behaviors and attitudes assumed by culturally non-dominant individuals living within a dominant culture (Berry 1974, 1997), and has been evaluated as a moderator of acculturative stress in a broad range of acculturation studies across academic disciplines (Barry, 2001; Sullivan, 2015; Ward & Rana-Deuba, 1999). Berry's model as illustrated in figure 2, describes a motivational framework for the adoption of four main strategies, stemming from two conditionally-related value statements (Berry, 1997).

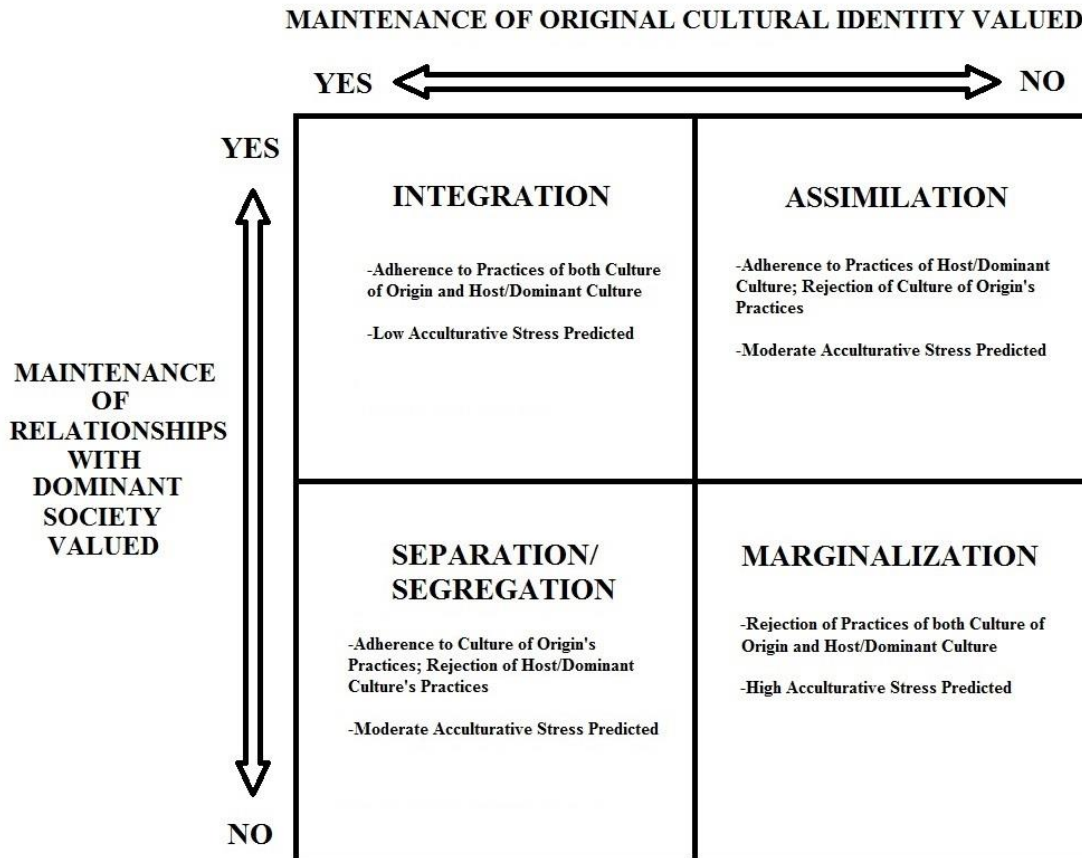


Figure 2. Berry's Acculturation Strategy Model (Berry, 1997)

The value positions above and to the left of the quadrants represent what Berry (1990, 1997) refers to as *attitudinal dimensions* and work in concert to determine the acculturation strategy of an individual. If preservation of one's original cultural practices, language and values is deemed important to the individual, then the individual would be characterized as valuing *cultural maintenance* and would be oriented toward the left side of Berry's model (integration or separation/segregation). Conversely, if an individual does not exhibit strong adherence to the practices of their culture of origin, they would orient to the right in this model (assimilation or marginalization).

The direction of acculturative strategy is further influenced by the attitudinal dimension represented on the left side of the model, which pertains to an individual's desire

to engage with, value and accept the cultural practices, language and values of the dominant host culture. If intercultural engagement is deemed important by an individual, that individual would be characterized as valuing *contact and participation* (Berry, 1997), and orient to the upper half of the model (integration or assimilation). Those rejecting the cultural practices of the dominant host culture orient toward the bottom of Berry's model (separation/segregation or marginalization). Taking these two attitudinal dimensions together places the individual into one of the four acculturation strategy quadrants. Each of these quadrants have been shown to correlate with specific levels of acculturative stress, and have been consistently predictive of the degree of acculturative stress regardless of a group's origin (Berry, Kim, Minde, & Mok, 1987).

Integration

Integration (top left quadrant) is the strategy embraced by intercultural migrants who find adaptive value in both cultural maintenance and engagement within the broader host population. This approach is characterized by a retention of the language, practices and values of the culture of origin, yet a simultaneous acceptance of and participation in the dominant host culture. Berry (1997) notes that the expression and usage of cultural practices and language in such bicultural individuals is highly situational, and that the degree of cultural maintenance/expression varies with regard to the cultural makeup of the immediate group. Consistently, within those intercultural migrant groups previously studied, the integration strategy is correlated with the lowest amount of acculturative stress of the four adaptive approaches (Berry, Kim, Minde, & Mok, 1987; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Separation/Segregation

The lower left quadrant represents the acculturative strategy employed by individuals who retain a strong adherence to the language, practices and beliefs of their culture of origin,

while largely rejecting, or being rejected by, those of the dominant host culture. Berry classifies this quadrant as “separation” for those individuals who volitionally choose to self-isolate from the dominant host culture, and “segregation” for those who have, by way of discrimination, prejudice or inequity, been involuntarily isolated from the dominant culture (Berry, 1997). This acculturation strategy is correlated with a moderate degree of acculturative stress (Berry, Kim, Minde, & Mok, 1987; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Assimilation

The quadrants to the right of the acculturation model signify those individuals who have rejected, abandon, greatly attenuated, or have been stripped of the elements of their culture of origin. In the case of assimilation (upper right quadrant), the individual has either chosen or been forced to discard their linguistic and cultural characteristics of origin, and replace them with the cultural and linguistic characteristics of the dominant host culture (Berry, 1997). It has been noted that certain overt features associated with the intercultural migrant’s culture of origin, such as ethnicity, accent, or other distinguishing factors, may impede complete assimilation in certain societies (Berry, 1990, 1997; Berry, Kim, Minde, & Mok, 1987; Li, Chen & Duanmu, 2010; Lowinger et al., 2014; Ma, 2015). Like the acculturation strategy of separation/segregation, Assimilation is associated with a moderate degree of acculturative stress (Berry, Kim, Minde, & Mok, 1987; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Marginalization

The lower right quadrant of Berry’s model signifies the acculturation strategy associated with the highest levels of acculturative stress: Marginalization. The marginalization strategy is characteristic of those cultural migrants who both reject, abandon or are stripped of the characteristics of their culture of origin, and reject, or are excluded from

the cultural practices of the dominant host culture (Berry, 1997). This maladaptive condition has been correlated with significant psychological stress, anxiety and depression within such individuals, and is considered the least desirable acculturative outcome (Berry, Kim, Minde, & Mok, 1987; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

It is important to note that while an individual's chosen acculturation strategy may reflect his or her personal aspiration for specific outcomes, the broader dominant host culture may or may not support the individual's choice. In other words, an intercultural migrant may desire to fully assimilate into the host culture, but broader attitudes, tolerances, or practices within the host culture may directly or indirectly exclude the intercultural migrant from full assimilation. This interplay between intercultural migrant and host culture may result in an individual's changing of acculturative strategy multiple times (Berry, Kim, Minde, & Mok, 1987).

Acculturative Stress

Acculturative stress may be defined as a stress reaction to the acculturative process in individuals and/or groups (adapted from Berry, 1995, 2005; Lin & Yi, 1997; Schwartz & Zamboanga, 2008; Smart & Smart, 1995; Sullivan & Kashubeck-West, 2015; Wei et al., 2001). According to Berry's model of acculturation, the various manifestations of cultural distance, including language differences, disparate social patterns, and contrasting personal attitudes and behaviors, are often expressed as acculturative stress within intercultural migrants. This stress, which is considered integral to Berry's theoretical model of acculturation, has been associated with confusion, depression, alienation, and compromised mental and physical health (Berry, 1980, 1990, 1994, 1995; Sullivan & Kashubeck-West, 2015; Stone, Feinstein & Ward, 1990; Ward & Rana-Deuba, 1999), and have been independently correlated with acculturation strategy (Berry, Kim, Minde, & Mok, 1987;

Sullivan & Kashubeck-West, 2015) and academic performance (Glass & Westmont, 2012; Li, Chen, & Duanmu, 2010; Sue & Zane, 1985).

The predicted and realized associations between acculturative stress and compromised physical and emotional wellbeing in intercultural migrants has resulted in the development of multiple scales designed to measure acculturative stress across a variety of cultural groups (Celenk & Van de Vijver, 2011; Rudmin, 2003; 2009). Acculturation theorists have widely embraced the use of such instruments to provide empirical indicators of the physical and socio-emotional stresses related to the acculturation process, and it is broadly contended that any study of the acculturation process should include an evaluation of the variety of related stressors (Berry, 1995, 1997; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Summary

International students are a large and growing population within American higher education. In the course of their studies abroad, international students frequently experience an array of challenges associated with intercultural transition, which in turn may lead to significant acculturative stress (Sullivan & Kashubeck-West, 2015). For first-year Chinese international students in particular, the cultural distance between China and the United States translates to significant differences in language and cultural practices (Berry, Kim, Minde, & Mok, 1987; Li, Chen, & Duanmu, 2010; Lowinger et al., 2014; Ma, 2015; Sullivan & Kashubeck-West, 2015). By following Berry's 1997 framework of Acculturation Theory we are positioned to conduct a historical, cultural and linguistic review of both the culture of origin and the dominant host culture for these students, and develop a fundamental understanding of the major acculturative barriers they experience. Furthermore, through this theoretical framework we are able to determine the acculturation strategies that these students employ, measure their levels of acculturative stress and explore the association between

acculturative stress and academic performance. The framework also supports the investigation of relationship between select stress-related variables and acculturative stress experienced by the student cohort. This triad of measures: Acculturative Strategy; Acculturative Stress, and Academic Performance has not been previously investigated in first-year Chinese international students at American colleges and universities.

Definition of Terms

Many of the terms within this work find their origins in the fields of sociology, cross-cultural psychology, and linguistics. Still others are translations of Chinese words. In such cases where there is no standard English term for a Chinese concept or phrase, the pinyin (拼音, the phonetic pronunciation of the word transcribed into the Latin alphabet) is used, followed by the Chinese characters (Hanzi; 汉字) in simplified Chinese, followed by an approximate definition/translation.

1. **Academic performance:** A measure of accomplishment as measured by overall grade point average (GPA).
2. **Acculturation:** The psychological, cultural and behavioral changes that occur when individuals or groups from different cultural contexts engage in prolonged, first-hand contact (Berry, 1974, 1990, 1997).
3. **Acculturation Strategy:** The attitudes and behaviors adopted by intercultural migrants in response to their relative desire to maintain their original cultural identity, and their desire to engage with the dominant culture within the society of settlement (Berry, 1997). Acculturation strategy, as measured within this study by Barry's East Asian Acculturation Measure (EAAM; Barry, 2001), is expressed in four distinct behavioral and attitudinal quadrants: assimilation; integration; marginalization, and separation (Berry, 1997).

4. **Acculturative Stress:** A stress reaction to the acculturative process in individuals and/or groups (adapted from Berry, 1995, 2005; Lin & Yi, 1997; Schwartz & Zamboanga, 2008; Smart & Smart, 1995; Sullivan & Kashubeck-West, 2015; Wei et al., 2001), and is measured within this study by Bai's Acculturative Stress Scale for Chinese Students (ASSCS; Bai.2012, 2015).
5. **Chinese International Student:** First-time, fulltime international undergraduate students from the People's Republic of China, studying at an American college or university on an F-1 visa. These students are further distinguished by identifying Chinese as their primary language; having no extensive educational experience (≥ 1 year) within in the U.S. or other English-speaking country, and having attended both primary and secondary schools in China, in which Chinese was the primary language of instruction.
6. **Collectivism:** A cultural construct/perspective characterized by (1) concern by a person about the effects of actions or decisions on others, (2) sharing of material benefits, (3) sharing of nonmaterial resources, (4) willingness of the person to accept the opinion and views of others, (5) concern about self-presentation and the loss of face, (6) belief in the correspondence of own outcomes with the outcomes of others, and (7) feeling of involvement in and contribution to the lives of others (Hu & Triandis, 1986).
7. **Confucianism:** A philosophical construct derived from the writings and teaching of Confucius (pinyin: Kongzi; 孔子 "Master Kong") which emphasize the importance of ethics, social harmony, group identity, and social and familial responsibility (Chan, 1999; Streep, 1995; Triandis, 2012).
8. **Cultural Distance:** The extent to which the shared values and norms in one country differ from those in another (Hofstede, 1980).

9. **Culture:** The shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that are learned through a process of socialization. These shared patterns identify the members of a culture group while also distinguishing those of another group (University of Minnesota Center for Advanced Research on Language Acquisition definition).
10. **Dialect:** A variety of a language that is distinguished from others of the same language by features of phonology, grammar, and vocabulary, and by its use by a group of speakers who are set off from others geographically or socially.
11. **Face:** (pinyin: liǎn; simplified Chinese: 脸). The psychosocial concept, particularly significant within East Asian cultures, of personal pride, respect and status within a social group (Cardon & Scott, 2003; Leung & Chen, 2001). The closely associated, “diulian” (丢脸) translates as “to lose face”.
12. **Individualism:** A social construct in which ties between individuals are loose and there is a general expectation of self-reliance, independence, self-motivation and self-direction within the society (Hofstede, 1980; Hu & Triandis, 1986).
13. **In-group:** An exclusive social subgroup in which members share distinct interests and identity (Brewer and Yuki, 2007).
14. **Phase:** The length of time that a migrating group or individual has been present in the culture of settlement (adapted from Berry, 1997).
15. **Zhuanke:** A three-year post-secondary educational program, typically in the form of technical or vocational training.

Chapter 2: Literature Review

This chapter is structured to provide an overview of acculturation research, acculturative stress, and the factors associated with cultural distance that may contribute to acculturative stress in intercultural migrants. It begins with an overview of the historical and theoretical foundations of acculturation research, and provides a framework upon which the current research assumptions are built. This is followed by an examination of the relevant research on acculturative strategy and acculturative stress as it pertains to Chinese and other international students. The third subsection of this chapter presents a discussion of cultural distance and the specific cultural-linguistic elements which contribute to the cultural distance between the United States and China.

Acculturation and Acculturative Stress: Historical Perspective and Development

Acculturation is most widely defined as the “phenomena which result when groups of individuals having different cultures come into continuous firsthand contact with subsequent changes in the original cultural patterns of either or both groups” (Redfield et al., 1939, p. 149). This phenomenon has been recognized across cultures and peoples for centuries, with the first written evidence appearing in contemporary accounts dated to four thousand years ago in Sumerian Mesopotamia (Algaze, 1989), and archeological evidence for Longshang cultural dispersal appearing in Neolithic China as early as 3,000 BCE (Tanner, 2010).

While historical accounts and the analysis of archeological evidence attest to widespread existence of acculturation phenomena throughout human history (Chun et al., 2003; Haglund, 1984; Rudmin, 2003; Starr, 2010), the formal academic study of acculturation and acculturative process is a far more recent phenomenon (Chun et al., 2003; Rudmin, 2003, 2009).

Dedicated academic research into the acculturative process finds some of its earliest American origins in work of University of Chicago sociologists William Thomas and Florian

Znanecki (Rudmin, 2009). In 1918 Thomas and Znanecki proposed a psychological theory of acculturation, derived from their work with Polish immigrants in the city of Chicago, which was comprised of three distinct personality-based strategies which they termed *Bohemian*, *Philistine*, and *Creative* (Persons, 1987). Thomas and Znanecki's work provided a nascent academic approach to viewing the process and dynamics of acculturation, which influenced the later work of University of Chicago's Robert Park in 1928 (Persons, 1987), and served as a philosophical cornerstone to the foundation of the University of Chicago's School of Sociology (Padilla & Perez, 2003).

As academic interest in acculturative process from a social, anthropological, and psychological perspective expanded, so too did the various theoretical approaches and models diversify. The following three decades of research saw the development of at least 15 separate acculturation models, describing a broad range of perspectives and taxonomies (Rudmin, 2009). The various schema employed descriptive, and in some cases fanciful terminology to categorize acculturative personality types and the acculturative strategies of immigrant groups, including: "Bohemian, Philistine and Creative" (Thomas & Znanecki, 1918); "Accommodation, Toleration and Compromise" (Ross, 1920); "Melting pot, Segregation, and Indirection" (Miller, 1924); "Reintegration, Symbiosis, Hybrid, and Transition" (Park, 1928); "Acceptance, Reaction, and Adaptation (Redfield et al., 1936) to name but a few. University of Tromsø's Floyd W. Rudmin presents a comprehensive catalogue of 126 acculturation models from 1918 to 2003 in his 2009 article for the International Association for Cross-Cultural Psychology, which aptly illuminates the diversity of competing taxonomies in the field (Rudmin, 2009).

The wide range of taxonomy within acculturative research likely finds its origins in the multidisciplinary nature of its interested scholars. Acculturation and acculturative stress have been studied in academic fields ranging from anthropology, archaeology, cross-cultural

psychology; ethnology, linguistics, sociology, political science and public health (Chun et al., 2003). It is therefore perhaps surprising then that such varying fields have, for the most part, converged upon an acculturation taxonomy and theoretical model developed by Canadian psychologist John Berry, and presented in its current form in 1997 (Chun et al., 2003; Ward, 1996; Ward & Rana-Deuba, 1999).

Berry's works represent a 4-decade evolution of perspective which includes a focus on both group and individual dynamics, and recognizes the influence of pre-migration experiences and social constructs. His research is considered by many to have helped set the theoretical framework of modern acculturation psychology, and his influence on acculturation research continues to reach across multiple academic fields (Sullivan & Kashubeck-West, 2105; Ward & Rana-Deuba, 1999).

Among his most influential work is his 1997 article for the International Association of Applied Psychology, in which he lays out a conceptual framework for acculturation research, and refines his earlier four-fold model of acculturative process (Berry, 1974, 1980, 1997). This article has been cited in the academic literature over 5,000 times (Google Scholar data), and serves as a fundamental theoretical model for numerous subsequent works investigating the acculturative process (Rudmin, 2009; Sullivan & Kashubeck-West, 2105; Ward & Rana-Deuba, 1999).

Of major significance to the present research, Berry's approach details several group-level and individual-level variables which may influence the acculturative process. These include individual moderating factors prior to acculturation such as a person's age, gender, education level, cultural distance (including language, culture, and religion), personal motivations, and individual personality (Berry, 1974, 1980, 1997). These factors have been shown to influence both acculturation strategy and acculturative stress in a variety of migrant

groups (Berry et al., 1987; Celenck & Van de Viver, 2011; Chin, 2003; Ngo, 2008; Salant & Lauderdale, 2003; Sandhu & Asrabadi, 1994; Thoman & Suris, 2004; Triandis, 1964, 1989).

Berry's model also includes group-level moderating factors; political, historic, demographic, economic, and social elements which may impact group acculturation and individual acculturation. Group-level variables are those characteristics considered to be broadly common among members of a society of origin, and directly influence individual-level variables (Berry, 1997). Furthermore, Berry recognizes the impact and significance of the society of settlement's characteristics in influencing acculturation (Berry, 1997). He contends that the rate and/or direction of acculturation, as reflected in acculturation strategy, is largely based on an interplay between the desires and attitudes of the migrant group/individual with the desires and attitudes of the society of settlement (Berry, 1997), and that actively pluralistic societies present a very different set of acculturative dynamics than do intentionally homogenous ones (Berry, 1974, 1990, 1997, Berry & Annis, 1974).

This approach to acculturation research, while widely employed, has also received some criticism for its complexity and chosen terminology (Bai, 2015; Lazarus, 1999; Triandis, 1997). Berry's broad suggestion that all of the key variables within his research model must be considered if acculturative research is to be considered complete, may become burdensome to smaller-scale research that is not concerned with providing such a comprehensive psychosocial, historical and cultural backstory (Chun, 2003). Van Hieu Ngo of the University of Calgary further suggests that Berry, as well as the majority of acculturation theorists, reflects the perspective of a white male of European descent who does not explicitly discuss this potential limitation in his research (Ngo, 2008). The present research however, due to its broad scope and intent, is well suited to this model.

Development of Acculturation Measures for Asian Migrants

At approximately 18.2 million, “Asian Americans”; a largely heterogeneous group, represent approximately 5.8% of the population of the United States (2014 Census Report). According to the Pew Research Center’s 2012 report, Asian Americans; an amalgamated term which includes 14 or more distinct Asian subgroups, are “...the highest income, best-educated and fastest-growing racial groups in the United States” (Pew Report, 2012, p. 1). While the Pew report cites a relatively high degree of integration, noting that 37% of Asian-American adult females in 2012 married non-Asians, it emphasizes the relatively recent arrival of most Asian Americans, citing that 74% of the current population was born abroad (Pew Report, 2012).

Despite the rather broad and somewhat artificial classification, “Asian Americans” and “Asians”, Asian intercultural migrants in general have received the attentions of a number of acculturative studies in recent decades. Indeed, numerous acculturation scales have been developed under the apparent assumption that Asians are a largely generalizable group. A notable, and regularly utilized scale was developed in 1987 by Richard Suinn and colleagues (Suinn et al., 1987).

Known as the Sinn-Lew Asian Self-Identity Acculturation Scale, or SL-ASIA, this 21-item validated survey was created to determine the relative level of Asian self-identity in Asian Americans and has been employed in numerous acculturation studies (Suinn et al, 1978; Suinn, Ahuna, & Khao, 1992). While the purpose of the tool is to ascertain individual levels of Asian self-identity, it takes a rather bi-polar approach to the consideration of “Asian” versus “American” values, which assumes that the terms “Asian” and “American” have some type of homogenized empirical meaning. Furthermore, the tool does not recognize that the individual may self-identify as a third, unrelated category.

Other generalized “Asian” acculturation measurement scales have been developed and employed in the literature within the past 20 years. These includes Bryan Kim, Donald Atkinson, and Peggy Yang’s Asian Values Scale (AVS); Maren Wolfe et al.’s European American Values Scale for Asian Americans (EAVS-AA), and R. Chung, Kim and Abreu’s (2004) Asian American Multidimensional Acculturation Scale (AAMAS). While each has been used in assessing the overall acculturative levels of Asian American (and Asian) subjects, critics have suggested that over-generalizing a large and heterogeneous population may yield very little in the way of distinctive insights into specific Asian subgroups (Ngo, 2008).

Recognizing the need for an acculturation strategy measurement tool designed specifically for East Asian migrants and aligned to Berry’s model of acculturation strategy, Declan Barry of Yale University developed and validated the East Asian Acculturation Measure (EAAM, Barry, 2001). This 29-item instrument is notable for its multidimensional measures of Acculturation Strategy, which include Berry’s four subscales of assimilation, integration, marginalization, and separation (Barry, 2001), and is therefore used as the acculturative strategy measurement tool selected for the current research.

Acculturation Strategies in Chinese International Students

Berry’s 1997 article further refines his four-fold acculturation strategy model, which was previously presented in 1974, 1980, 1990, and 1995. This model, detailed in full in chapter I, establishes the widely-used acculturation strategies of integration, assimilation, separation, and marginalization and provides a descriptive, values-based paradigm of behaviors and attitudes adopted during the acculturation process. Berry’s model has been empirically linked to predictable levels of acculturative stress in migrant and sojourning populations, and stands as one of the most utilized models for describing acculturative strategies in groups and individuals in the acculturative research literature (Chun et al., 2003; Celenck & Van de

Viver, 2011; Ngo, 2008; Rudmin, 2009; Schwartz & Zamboanga, 2008; Sullivan & Kashubeck-West, 2015; Ward, 1996; Ward & Kennedy, 1999; Ward & Rana-Deuba, 1999).

Berry employs a multidimensional approach to characterizing acculturation strategy has been largely favored over more unidirectional acculturation models, which express the acculturation process along a linear continuum (e.g., low, moderate or high acculturation) (Sullivan & Kashubeck-West, 2015; Ward, 1996; Ward & Kennedy, 1999; Ward & Rana-Deuba, 1999); presenting a paradigm where each strategy is defined by the interplay between an individual's desire to retain their culture of origin, and their desire to engage with the dominant culture of settlement (Berry, 1997). Each quadrant within the model has been shown to be associated with particular levels of socioemotional anxiety and acculturative stress and is recognized as a reliable standard within acculturation research (Celenck & Van de Viver, 2011).

The association between acculturative strategy and specific levels of acculturative stress in Chinese international students was supported in 2011 by a cross-cultural study in the journal of Academic Psychiatry by physicians Jia-Ya Pan and Daniel Fu Keung Wong (Pan & Wong, 2011). Pan and Wong compared acculturative stress levels of Chinese international graduate students studying at two institutions; one in Hong Kong, the other in Australia. Their research revealed that Chinese international students in Hong Kong experienced significantly lower levels of stress than their counterparts studying at the Australian university; that students employing an integration or separation strategy reported moderate levels of acculturative stress, and that students in both groups who adopted a marginalization strategy experienced the highest levels of acculturative stress (Pan & Wong, 2011). The study further revealed that cultural difference and academic pressure had a significant impact on levels of acculturative stress (Pan & Wong, 2011).

While Pan and Wong's work is specific to graduate students at universities in Australia and Hong Kong, the results may be broadly generalized to the current research, as the general cultural-linguistic construct of Australian institutions of higher education, like the American education system, are founded upon a Western European, primarily British model (Altbach, 1998). Nevertheless, it is important to note that the subjects within Pan and Wong's study were graduate-level students, representing candidates for doctoral (64% Hong Kong sample; 46% Australian sample), and master's level (36% Hong Kong sample; 47% Australian sample). Likewise, the average age of the participants was significantly higher (26.7 HK sample; 24.6 Australian sample) than the participants of the current study. While the differences in average age of the participants, and the overall differences in degree-level and higher education experience may have a limiting impact on the direct extrapolation of this study to the current research, the study does clearly identify acculturation strategy as it relates to acculturative stress and other stress-related variables within a broadly similar cohort.

The broader academic narrative regarding the social patterns in Chinese international students is fairly consistent; citing relatively low levels of intercultural engagement, high in-group adherence, and relatively high levels of cultural and linguistic adherence, characteristic of the separation acculturation strategy (Du & Wei, 2015; Lueck & Wilson, 2010; Stevens, 2012; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015). While a review of the research reveals a common theme with regard to reduced intercultural engagement in Chinese international students, very few studies directly analyze the acculturation strategies adopted by their samples.

In the few studies that have attempted to measure and categorize acculturation strategy in Chinese international students, there appears to be some disagreement over the most common formal acculturation strategies adopted by them. While the majority of authors indicate a predominantly separation-oriented strategy in Chinese internationals (Bartlett & Fischer,

2011; Bertram et al, 2014; He, Lopez and Leigh, 2012; Lowinger et al, 2014; Wang, et al, 2012; Wei, Liao et al, 2012; Yan and Berliner, 2011; Yu et al, 2014; Yuan, 2011), work by Kline and Lui, which attempted to formally identify their acculturation strategies, found Chinese international students to adopt an acculturation strategy midway between separation and integration (Kline & Liu, 2005). In addition to some conflicting findings with regard to confirmed or suggested acculturative strategies, it is important to note that most of the research data in these studies were developed with somewhat broad samples; consisting of wide age ranges, education levels, and other potentially confounding demographic differences. Significantly with regard to the present study, no previous research has yet analyzed the most common acculturation strategy employed specifically by first-year Chinese international Undergraduates.

The only other acculturation strategy that appears with regularity within groups of Chinese international students is that of integration (Kline & Liu, 2005; Pan & Wong, 2011). The integration strategy is adopted by migrants who value both a retention of their original cultural/linguistic characteristics, and an active engagement with the culture of settlement (Berry, 1997). The integration strategy has been consistently associated with the lowest levels of socioemotional and acculturative stress in intercultural migrant groups, and has been associated with increased phase (time spent in culture of settlement), intercultural engagement, education level, and income levels (Abraído-Lanza, 2006; Berry, 1989, 1995, 2005; Berry & Annis, 1974; Berry, Kim, Minde, & Mok, 1987; Berry & Kim, 1988). While integration is considered the most positively adaptive of the four acculturation strategies, the very limited phase of first-year Chinese international students is predicted to be reflected in a predominantly separation-oriented acculturation strategy in the context of this study.

In general terms, identifying the most common acculturation strategies adopted by first-year Chinese international students will not only help in making general predictions of

expected acculturative stress levels, but also lend important insight into the values, behaviors and attitudes of the migrating group.

Acculturative Stress in Chinese International Students

Acculturative stress has been variously defined as: a stress reaction in response to life events that are rooted in the experience of acculturation (Berry, 2005, p. 70); psychological difficulties associated with adapting to a new culture (Smart & Smart, 1995, Wei et al., 2001), and psychosocial stressors resulting from unfamiliarity with new cultures and social norms (Lin & Yi, 1997). In recognition of the broad psychological, social, behavioral, and physical elements that are associated with the acculturation process, a synthesis and simplification of these three definitions are here adapted to: Acculturative stress is a stress reaction to the acculturative process in individuals and/or groups. This modification allows for acculturative stress to remain distinct from a process of adaptation, (which may or may not be present [Triandis, 1997]), and remains broad enough to include all possible types of both socio-emotional and physical stress reactions. Furthermore, as the acculturation process may result in stress in both the migrant and host communities, it is important not to confine the phenomenon solely to the migrating group or individual. This modified definition reads closest to Berry's (2005), but with the intentional omission of "life events", which appears to exclude internal psychological, emotional and physical phenomena and attitudinal shifts, and includes "individuals and/or groups" in recognition of acculturation as both an individual and a group process (Berry, 1990, 1995; Berry & Annis, 1974; Triandis, 1989, 1997).

In general, acculturation researchers have looked to understand how various elements within the acculturative process directly or indirectly affect socioemotional wellbeing in immigrant individuals or groups. While not universally identified as "acculturative stress" in the research literature, numerous studies of acculturation-related, socioemotional stress

within Chinese international students offer significant support to the selection of variables considered by the current study.

Measuring Acculturative Stress in Chinese International Students

While multiple researchers have recognized the acculturative challenges faced by Chinese international students at Western institutions of higher education, most have adopted and adapted existing acculturative stress measurement scales which were developed for different cohorts. Recognizing the relative absence of acculturative stress scales designed specifically for use with Chinese international students at American institutions of higher education, Jeiru Bai published findings of her 2012 doctoral dissertation in the August, 2015 volume of *Psychological Assessment* (Bai, 2015). There, Bai reviewed three well-validated acculturative stress scales: Sandhu and Asrabadi's Acculturative Stress Scale for International Students (ASSIS; Sandhu & Asrabadi, 1998); Yang and Clum's Index of Life Stress for Asian Students (ILS, Yang & Clum, 1995), and Pan et al.'s Acculturative Hassels Scale for Chinese Students (AHSCS, Pan et al., 2010). She identified various strengths and weaknesses of each scale, and described the process of using qualitative interviews with Chinese undergraduates to identify gaps in topic coverage within these scales. Utilizing aspects of the aforementioned scales, she then developed a scale designed to cover nine domains: 1. Academic pressure 2. Language deficiency 3. Cultural difference 4. Social interaction 5. Perceived discrimination 6. Financial concerns 7. Safety and health 8. Feelings toward family 9. Feelings toward others (Bai, 2015). Depression levels in participants were measured by Zung's Self-Rating Depression Scale (Zung, 1965), which has been translated into Chinese and validated within Chinese samples (Bai, 2012, 2015).

Bai's survey was completed along with demographic information, by 267 participants and checked for validity. The result was a refinement of the scale to a 32-item, five-factor, Likert scale survey measuring; 1. Language deficiency 2. Social isolation 3. Perceived

discrimination 4. Academic pressure, and 5. Guilt toward family (Bai, 2012, 2015). Bai named this scale the Acculturative Stress Scale for Chinese College Students in the United States (ASSCS).

Her research found language barriers to be the most significant challenge for her sample, and correlated language deficiency with both academic pressure and social isolation (Bai, 2012, 2015). While the results of her sample were not discussed with regard to perceived discrimination, the author notes that perceived discrimination has been shown to correlate with mental health issues and depression by Chan, Tran & Nguyen (2012) and Mori (2000), and concludes that the domain is appropriate to the scale (Bai, 2012, 2015).

Feelings of academic pressure were shown to correlate with language deficiency, which is supported by both the results of Bai's survey, and a wealth of previous studies (Jin & Liu, 2014; Liu, 2002; Lueck & Wilson, 2010; Lowinger et al., 2014; Martirosyan, Hwang, & Wanjohi, 2015; Wicks, 1996).

Bai's fifth dimension, guilt toward family, represented a novel item which was identified within the study during the interview process (Bai, 2012, 2015). Bai asserts that feelings of familial obligation factored into the suite of reported concerns, and because of the strong historical association with Confucian filial piety in Chinese people, the dimension was appropriate to the scale (Bai, 2012, 2015).

The strength of this research lies in the intentional development of a scale for use in a well-defined population (Chinese college students in the United States), its translation into Mandarin, its statistical validation, and its acknowledgement of previous guiding research. The author suggests that the ASSCS is the first of its kind developed specifically for this population (Bai, 2012, 2015), and it has been selected for use within the current study based on its specificity regarding the intended sample population.

Stressors within the Acculturative Process

Phase, Social Integration, and Acculturative Stress

The identification of stressors related to the acculturation process in Chinese international students is essential to developing a descriptive paradigm of this complex and multidimensional process. In 1985, University of California Los Angeles' Stanley Sue and Nolan Zane published a study in the *Journal of Counseling Psychology* which stands as one of the earliest investigations of socioemotional adjustment and academic achievement in Chinese university students (Sue & Zane, 1985). This work was designed to compare academic performance and socioemotional acculturation in both foreign-born, early- and recent-immigrant Chinese, and to uncover whether there are differences in adaptation strategies employed by these three groups (Sue & Zane, 1985). Furthermore, the study investigated study habits and choice of academic major, and whether immigration status had significant impact on these variables.

Sue and Zane surveyed a total of 177 Chinese undergraduate students drawn from freshman, sophomore, junior and senior levels at University of California, Los Angeles. Of these, 57% were foreign-born (44% from Taiwan; 37% from Hong Kong; 4% from mainland China; 4% from Burma [Myanmar], and the remaining 11% from "other parts of the world" (Sue & Zane, 1985, p. 573). The sample contained 90 male subjects and 87 female subjects, evenly distributed by year. Because the sample consisted of "Chinese" students that varied significantly in regard to country of birth (a full 43% of the respondents were American-born) and length of stay in the US (phase), the group was analyzed as a tripartite sample: American-born Chinese (AB); Early Immigrant Chinese (EI) (foreign-born Chinese living >6 years in the US), and Recent Immigrant Chinese (RI) (foreign-born Chinese living ≤6 years in the US).

With regard to academic performance, the authors found that Chinese students' overall GPA was 2.99, compared to the university cumulative average of 2.87, with no significant gender differences within the study group. This measure combined the three groups (AB; EI and RI) despite the potential differences in language proficiency and level of socioemotional acculturation, and while the combined measure provides a very generalized baseline, the study would have likely benefitted by a more discrete measure of academic achievement by cohort (AB; EI, and RI).

With regard to socioemotional adjustment/acculturation, Sue and Zane showed a clear distinction in the populations related to measures of happiness and satisfaction, anxiety, autonomy, social extroversion, personal integration, and altruism. The study found recent immigrant Chinese (foreign-born with ≤ 6 years in the US) to score lower in overall happiness, autonomy, social extroversion, personal integration and altruism than did their American-born counterparts. Additionally the authors found recent immigrant Chinese students to report higher levels of anxiety than their American-born peers and Chinese students with six or more years in the US (Sue & Zane, 1985). These findings support intercultural engagement/socialization and phase (time spent in the host culture) as important variables in the manifestation of socioemotional adjustment and acculturative stress. For these reasons, the relationships between acculturative stress and phase (as captured by a combination of continuous time in the U.S. + the number of previous U.S. visits) and the number of close American friends (a measure of intercultural engagement) are investigated in the current study.

While Sue and Zane's study did not attempt to evaluate students with regard to specific acculturative strategy, it serves as an important early example of empirical evidence in establishing the relationship between acculturative stress, social integration, phase, and academic performance in Chinese university students. The limitations of this study are

primarily in the overall assumption that “Chinese students”, whether American-born or foreign-born, have some generalizable commonalities, and that academic performance can be accurately represented by an average GPA which combines three very different subgroups of Chinese students.

Despite these potential shortcomings, Sue and Zane’s work correlating levels of depression with acculturation/acculturative stress in Chinese international students found strong support in later research by Meifen Wei and colleagues in the *Journal of Counseling Psychology* (2007), which showed a clear relationship between acculturative stress and intercultural integration, and recognized that the degree of acculturative stress is likely related to the cultural distance between them and the host culture (Wei, et al., 2007). These findings support Bai’s inclusion of social isolation as a primary stressor in the ASSCS instrument (Bai, 2012, 2015), and agree with later work by Zhang and Goodson (2010); Pan and Wong (2011); Yakunina et al, (2011); Yan and Berliner (2011); Yuan (2011); He, Lopez, and Leigh (2012); Wang, et al. (2012); Wei, Liao et al. (2012); Bertram et al. (2013); Lowinger et al. (2014), and Yu et al. (2014), which further support the correlation between Chinese students’ social integration with the host culture with levels of depression and psychological wellbeing. Bai’s acculturative stress model represents these social integration stressors within the variables of “Social Isolation” and “Perceived Discrimination”, and represented graphically in figure 7 in the summary section of this chapter (Bai, 2012, 2015).

The growing body of evidence linking acculturative stress and depression to social connectedness was expanded in 2010 by Jing Zhang and Patricia Goodson in their article in the *International Journal of Intercultural Relations*: “Acculturation and psychosocial adjustment of Chinese international students: Examining mediation and moderation effects”. Zhang and Goodson approached this research by adapting the Vancouver Index of Acculturation (VIA; Ryder et al., 2000), Islam and Hewstone’s Intergroup Contact Scale

(1993), Lee et al's Social Connectedness Scale (2001), Radloff's CES-D depression scale (1977), and Ward and Kennedy's Sociocultural Adaptation Scale (Ward & Kenney, 1999). Their sample of 508 Chinese international students consisted of both undergraduate and graduate students, with a majority being graduate students (Zhang & Goodson, 2011).

Through their sample data, Zhang and Goodson found that intercultural interaction and intercultural social connectedness with Americans had a significant moderating impact on depression and sociocultural adjustment difficulties (Zhang & Goodson, 2011). This lends further strength to the inclusion of "Number of American Friends" as a possible explanatory variable to the response variable of acculturative stress in the current study.

The literature identifying intercultural integration as a mediating factor in acculturative stress in Chinese international students was advanced by Yi Du and Meifen Wei in 2015 in their research in *The Counseling Psychologist* (Du & Wei, 2015). Their work utilized Berry's (1997) theoretical framework to investigate the impact of intercultural social connectedness on acculturation and wellbeing using six separate acculturation and life satisfaction scales. Du and Wei's survey analysis of 213 Chinese international students at a large Midwestern state university found intercultural socialization significantly reduces acculturative stress, and that students with higher levels of acculturation reported higher life satisfaction and positive affect (Du & Wei, 2015). These results agree with numerous studies linking cross-cultural integration with the host culture to lower levels of overall acculturative stress. However, as with many of the earlier studies previously referenced, the mixture of graduate-level (50%) and undergraduate students; the broad range of subject age (18-34), and the related differentials in previous academic and social experiences, one is left cautious of the precise implications to first-year Chinese international students.

Communication Patterns and Family Cohesion

Additional acculturative stressors and stress moderators were identified in Susan Kline and Fan Liu's study linking communication patterns and types and family relationships with levels of acculturative stress in Chinese international students (Kline & Liu, 2005). Kline and Liu utilized the Acculturative Stress Scale of International Students (ASSIS) developed by Sandhu and Asrabadi (Sandhu & Asrabadi, 1994) to measure levels of stress related to perceived discrimination (also captured in Bai's model [Bai, 2012, 2015]), homesickness, and fear and stress due to change. They additionally employed a modified version of Cuellar, Harris and Josso's acculturation scale (1980) to assess the individual level of acculturation in study participants.

Kline and Liu identified their subjects (N=99) overall as exhibiting a low to average stress level with a moderate level of acculturation; falling between a separatist (separation) and bicultural (integration) acculturation strategy (Kline & Liu, 2005, p. 378). These findings appear somewhat inconsistent with sociocultural patterns identified within Chinese international students in general (Kim, Omizo, & Michael, 2005; Lin & Betz, 2009; Liu, 2002; Lowinger et al., 2014; Stevens, 2012). However, because Kline and Liu's sample differed in average age (52% of Kline and Liu's sample was over the age of 25), marital status (30% were married), and phase (time in the U.S ranged from 2-5 years), the current study seeks to clarify the adopted acculturation strategy in a younger, unmarried, first-year undergraduate population.

In addition to the acculturation strategy and related acculturative stress findings, their research revealed that students with the highest level of family cohesion, and the most frequent family communication and topic diversity within those communications showed the lowest levels of acculturative stress (Kline & Liu, 2005). Notably, they found that students exhibiting the highest levels of acculturative stress preferred phone communications over

email correspondence (Kline & Liu, 2005 p. 384). While Kline and Liu were cautious to attribute direct causal links, they suggest that family communication may play a supportive role in acculturative stress moderation in Chinese international students. These findings further support social interaction, specifically with regard to parental/familial communication, as an important element in the moderation of acculturative stress in this cohort, and has been included as a possible explanatory variable within the current study (see figure 7, p. 74).

Cultural Distance, Acculturative Stress, and Academic Impacts

The influence of phase and cultural distance on socioemotional anxiety in Chinese international students was explored by Meifen Wei, Michael Mallen, Paul Heppner and colleagues in 2007 (Wei et al, 2007). Wei and colleagues investigated acculturative stress and depression in Chinese international students in relation to the number of years spent in the U.S. (phase), and their level of maladaptive perfectionism (Wei et al, 2007). Significantly, their work recognizes the impact of cultural distance on the acculturation process, noting that "...Asian (including Chinese) international students experience more acculturative stress than European international students because the former may experience more cultural differences than the latter" (Wei, et al., 2007, p. 385). This is supported by earlier work by Robertson, Line, Jones and Thomas and Misra, Crist and Burant which show significantly more acculturative stress in individuals from cultures that differ widely from that of the host culture (Misra, Crist, & Burant, 2003; Robertson et al, 2000)

Wei and colleagues measured accumulative stress using Sandhu and Asrabadi's ASSIS instrument, and showed a positive association between acculturative stress and depression in Chinese international students. Additional data linked maladaptive perfectionism (i.e., discrepancy between expectations and performance) (Wei et al., 2007, p. 385), with depression, and confirmed a three-way interaction between acculturative stress, maladaptive

perfectionism and length of time in the U.S. These data lend further support to the connection between acculturative stress, depression, academic performance (maladaptive perfectionism), and cultural competency (assumed by length of stay in the U.S./phase).

In 2012 Flora He, Violeta Lopez, and Maria Leigh explored acculturative stress and sense of coherence in Chinese nursing students at an Australian public university in Sydney (He, Lopez, & Leigh, 2012) utilizing the ASSIS instrument and Antonovsky's Sense of Coherence Scale (SOC) (Antonovsky, 1987). 119 predominantly female (90.75%) Chinese, 3-year nursing program students were surveyed and revealed that they experienced moderate levels of acculturative stress and sense of coherence. Interestingly, third-year students reported the highest levels of stress, which appears to contradict Wei et al's finding that the length of time in a host country has moderating effects of acculturative stress (Wei et al., 2007). However, the authors noted that several factors, such as looking for professional placement and studying for board exams that were experienced by third-year students but not by years one and two, may have contributed to overall feelings of stress in that group (He, Lopez, & Leigh, 2012). This interpretation of the data suggests that both academic pressure and phase (time in country) have an impact on acculturative stress, with academic pressure being the more influential of the two. Consistent with this logic, students within the year one cohort experienced the second highest levels of stress, which the authors attribute to difficulties associated with acculturation rather than with external factors (He, Lopez, & Leigh, 2012). While supportive of the current research, it is recognized that the gender-specificity of this study, as well as the presence of specific proximate stressors may limit the direct extrapolation of its findings.

Cultural Identity and Acculturative Stress

Building upon their earlier work in maladaptive perfectionism and acculturative stress in Chinese international students, Meifen Wei and colleagues undertook an investigation into

acculturative stress and psychological distress in Chinese international students (Wei et al., 2012). Again using Berry's theoretical framework of acculturative strategy, Wei and colleagues sought to measure and correlate levels of acculturative stress, forbearance coping (a coping strategy in which individuals minimize or conceal problems or concerns), psychological distress, and identification with the heritage culture (Wei et al., 2012). The research compared results of the Collective Coping Styles Measure (CCSM, Moore & Constantine, 2005); the Vancouver Index of Acculturation (VIA; Ryder, Alden, & Paulhus, 2000); the ASSIS (Sandhu & Asrabadi, 1994), and the Hopkins Symptom Checklist of psychological distress (HSC; Green, Walkey, McCormick, & Taylor, 1988) to assess stress levels in 188 Chinese, majority (82%) graduate international students. Regression analysis indicated that forbearance coping was not associated with significant psychological stress when students exhibited strong cultural heritage identification, independent of high or low levels of acculturative stress (Wei et al., 2012). In other words, those students who held closely to their culture of origin appeared to experience little stress related to their forbearance behavior. The study further correlated psychological stress with acculturative stress, and was significant in distinguishing between the effects of forbearance and acculturative stress (Wei, et al., 2012).

While the structure Wei's study is not designed to establish direct cause and effect relationships between variables, its value in further supporting the links between psychological stress, acculturation, and sociocultural factors is clear; the acculturative process is linked to psychological stress, and pre-existing sociological factors play an important role in the adoption of specific coping strategies.

Pre-existing Individual-level Variables and Acculturative Stress

In 2012, Kenneth Wang, Paul Heppner, Chu-Chun Fu, Ran Zhao, Feihan Li, and Chi-Chun Chuang published a study in the *Journal of Counseling Psychology* which recorded

levels of acculturative stress in 507 Chinese (80% graduate-level) international students (217 females; 290 males) over four periods: Pre-arrival; First semester; Second semester, and Third semester. The study assessed students' psychological stress as an indicator of acculturative adjustment through the use of Slaney et al.'s APS-R perfectionism scale (1996), Heppner et al.'s Collectivist Coping Scale (CCS; Wang et al., 2006); Tian, Heppner, Hou and He's Chinese Problem-Solving Inventory (CPSI; Tian et al., 2008); Sandhu and Asrabadi's ASSIS (1994), Rosenberg's Self Esteem Scale (RSES; Rosenberg, 1965), and Derogatis' Brief Symptom Inventory (Derogatis, 2000). The authors found that students fell into four distinct categories:

- 10% *Consistently Stressed* (Students exhibiting high levels of psychological distress at each measurement period).
- 14% *Relieved* (Students showing a decrease in psychological stress over pre-arrival to first semester).
- 11% *Culture Shocked* (Students experiencing a sharp increase in psychological distress in the first and second semesters)
- 65% *Well-adjusted* (Students showing consistently low levels of psychological stress at all measurement periods).

Perhaps the most surprising result of this study is the relatively high percentage of students that reported moderately low levels of psychological and acculturative stress throughout their intercultural transition. The authors suggest that this finding further supports Berry's (1997) assertion that pre-existing factors have a significant role in the outcomes of an acculturative process; that previous educational experience (the great majority [80%] of the sample was composed of graduate students with previous higher education experience) is an important explanatory factor for acculturative stress. This pre-existing exposure to academic and social interactions, previous experience with living away from home, experience in

increased personal responsibilities and other factors associated with their earlier higher education experience cannot be fully discounted.

Of significant interest to the current research is the 35% of students falling into the Consistently Stressed, Relieved, and Culture shocked groups. Wang and colleagues' study reveals that students who report high levels of self-esteem, more positive problem-solving appraisal, and strong academic habits before arrival are associated with the lowest levels of acculturative stress (Wang, et al., 2012). Because these variables have been shown in other study cohorts to positively correlate significantly with family income and education levels (Fadem, Schuchman, & Simring, 1995; Hahs-Vaughn, 2004), the present study includes these factors as potential explanatory variables of acculturative stress (see figure 7).

Wang and colleagues' research suggests that pre-existing variables are largely predictive of future acculturative stress during and throughout intercultural transitions. This finding underscores the importance of gathering historical and demographic information on study participants, and the value of pre-transition evaluations of psychological stress. It is essential to recognize, however, that these data are principally confined to graduate-level sojourners, and that an extrapolation of these findings to a less experienced undergraduate population may be potentially inaccurate.

Language Proficiency and Social Integration Revisited

In an attempt to further identify acculturative stressors and stress-related variables, Kun Yan and David Berliner's 2013 article for the Journal of College Student Development reported on personal and sociocultural stressors for Chinese international students in the United States, and provided a qualitative perspective on the impact of acculturative stress. Their work, based on interviews with 18 masters and doctoral-level graduate students (10=f; 8=m) and utilizing Berry's theoretical framework (Berry, 1997) identified four key areas of stress in these students. These include the self-identified factors of 1. Social isolation 2.

Language barriers 3. Financial limitations 4. Immigration status, and 4. Familial pressures (Yan & Berliner, 2013).

While this study is important in its broad support of the types of acculturative stressors that had been previously identified in the research literature, like Wang et al.'s research of 2012, it is confined to a sample of graduate students, and therefore may have limited direct implications with regard to the undergraduate experience. Nevertheless, the identification of stress-related variables of social isolation, language barriers, and familial pressures correspond well with the variables covered in Bai's survey instrument (Bai, 2015).

In more direct support of the current research, a somewhat small-scale research project by Bertram, Poulakis, Elasser and Kumar in the *Journal of Multicultural Counseling and Development* provided a useful qualitative perspective to identify primary stressors and stress mediators in Chinese undergraduate students (Bertram et al., 2014). Extensive interviews conducted with eight Chinese international undergraduates (m=4; f=4) strongly supported previous research findings that; 1. Chinese international students socialize most frequently with other Chinese; 2. Perceived/self-reported language barriers were identified as the students' primary source of acculturative stress and barrier to intercultural socialization; 3. Cultural distance was a secondary stressor, and 3. Parents and compatriots served as the primary social support for these students (Bertram et al., 2013). While the sample was admittedly limited, the recurring themes around language barriers, cultural distance and intracultural versus intercultural socialization remain consistent with the broader research literature and the research variables of the current study (Bertram et al., 2014). Additionally, because the stressors were self-identified by the students, and students were queried about both pre-sojourn and post-sojourn the study offers an additional perspective to the wider empirical study of acculturative stresses in these students.

Acculturative stressors and stress-related variables in Chinese international students were further examined in Robert Lowinger, Zhaomin He, Miranda Lin, and Mei Chang's 2014 investigation of the impact of academic self-efficacy, acculturation difficulties, and language abilities on academic attitudes and performance in Chinese international students (Lowinger et al., 2014). Their survey of 264 Chinese international students (30.6% undergraduate, 60.4% graduate) attending 3 public universities revealed some significant findings regarding language-based academic and acculturative challenges this group (Lowinger et al., 2014).

The authors reported unexpected gender differences with regard to academic strategies in their cohort, correlating males' academic procrastination behavior with: 1. Feelings of discrimination, and 2. Feelings of homesickness (Lowinger et al., 2014). Female respondents' procrastination behavior on the other hand, was correlated most strongly with self-reported challenges in: 1. Academic self-efficacy 2. English language ability, and 3. Feelings of culture shock and stress (Lowinger et al., 2014). These findings are particularly interesting given that there is little previous evidence for gender differences in the preceding acculturative literature.

In general, this work is supportive of the relationship between language proficiency, acculturative stress and academic attitudes and performance in Chinese international students, and emphasizes the relevance of gathering relevant data on participants in the current study.

Foundations of Cultural Distance

Chinese and American Identity and Socialization as Reflected through Education

In his seminal work of 1997, John Berry asserts that to reasonably understand the acculturative process within any group, one must first conduct a review of the psychosocial, historical-cultural, and linguistic constructs of both the culture of origin and the subsequent host culture. In presenting his theoretical framework for acculturation Berry writes:

“It is contended that any such study that ignores any of these broad classes of variables will be incomplete, and will be unable to comprehend individuals who are experiencing acculturation.” (Berry, 1997, p. 15-16).

Cultural distance is defined as the extent to which the shared values and norms of one country differ from those in another (Hofstede, 1980), and is considered an essential source of acculturative stress experienced by intercultural migrants (Berry, 1989, 1990, 1995, 1997, 2005). In order to accurately establish the degree of cultural distance in migrant groups, Berry’s theoretical model prescribes a review of the social and cultural constructs of both the culture of origin and the host culture (Berry, 1997). It is through an exploration of the elements that contribute to cultural distance that we uncover the root-causes of specific stressors and stress-related variables which may have a downstream impact on academic performance in first-year Chinese international students.

Daniel Pratt’s work on the historical and cultural roots of divergence in Chinese and American students provides an informed overview of social and self-identity patterns within contemporary China, and contrasts these with the traditional American models (Pratt, 1991). Pratt describes the Chinese “sense of self” through the Confucian traditions of loyalty to family (filial piety); role-based social structure; perseverance; sense of duty; obedience and loyalty to society. He maintains that the Chinese learner is conditioned to a social construct in which family and cultural tradition are of paramount importance, and that a highly stratified hierarchy within the family and throughout Chinese society is the result of such traditions. Indeed, the structure and practice of education in contemporary China still reflects much of this adherence to hierarchy, conformity, and obedience (Zhao, 2014). This perspective lies in contrast to traditional American social and attitudinal patterns that encourage individualism, democracy, and personal freedoms (Fukuyama, 1995).

Cross-cultural psychologist Harry Triandis of Cornell University supports this perspective, and asserts that child-rearing in collectivized societies such as China tends to focus primarily on conformity, loyalty, obedience, and the acceptance of specific roles within the family and community (Triandis, 1989, 1995, 2012). He suggests that significant importance is placed on the group over the individual in collectivized societies, and that the primary in-group in Chinese society is a person's direct and extended family. This adherence to family structure follows the traditional model of Confucian familial piety, and runs consistently throughout Chinese social, political, and educational structures (Chan, 1999; Ho & Crookall, 1995; Li, 2003). Indeed, this deeply ingrained responsibility toward family has been shown to result in considerable psychological stress in Chinese international students who have left their families in order to study overseas (Bai, 2015). What Jeiru Bai terms "guilt toward family" contributes to the suite of stressors experienced during the acculturative process in Chinese international students, and is a significant variable in Bai's acculturative stress scale for Chinese international students (Bai, 2015).

For the purposes of this study, it is both convenient and relevant to explore Chinese cultural traditions through the lens of educational practice, as educational systems largely reflect the cultural constructs from which they emerge (Zhao, 2014). China has a cultural tradition of education and learning that places high value on academic achievement (Pratt, 1991; Zhao, 2014). Indeed, the writings and teaching of Chinese philosopher and scholar K'ung-fu-tzu (孔夫子 [Confucius]) so influenced the social structure of China, that aspiring to the level of an educated citizen is a nearly universal goal (Csikszentmihalyi 2005, Pratt, 1991; Zhao, 2012). There remains a strong emphasis on education and personal advancement through study in China, and the prospect of sending one's child to study at a top university in America represents the pinnacle of this aspiration (Zhang, 2003).

Susan Chan's *The Chinese learner: a question of style* (Chan, 1999) provides an excellent review of the stylistic differences between Chinese and western learners. Chan outlines the pervasive influence of the teachings of Confucius, and how the development of Confucianism in China in the 4th and 3rd centuries BCE led to the distinct studying and classroom styles, characterized by rote memorization, repetition, and academic rigidity still practiced in China today. Additional works by Ho and Crookall (1995), Li (2003), and Zhao (2014) support this view of Confucianism's deep impact on the psyche, learning styles, and cultural attitudes of the Chinese. Although these authors tend to agree on the historical context of Chinese educational attitudes and practices, not all agree on the relative impact of this context on the individual Chinese learner.

David Kember takes an alternate view regarding the stereotypes of Chinese learners as "surface learners", rigid and prone to rote memorization. Where he acknowledges the Chinese educational system as one which emphasizes verbatim repetition of classics and other material, he suggests that Chinese students rely more on creative thinking than has been suggested in previous writings on the subject (Kember, 2000). Kember focuses more on post classroom reflection and variant methods of studying in Chinese students which may be more similar to western modes of study than previously thought. It is interesting to consider the two opposing views carefully, as the development of any study concerning learning and stylistic challenges to Chinese students must guard against potential stereotyping bias.

Nevertheless, there are distinct cultural differences between Chinese and American students with regard to the overall approach to education and its specific role in the life of the student, the family, and within society. Much of this difference is due to the specific educational and cultural histories of the two nations (Pratt, 1991; Zhao, 2014).

While archaeological evidence exists supporting the development of formalized education near present-day Shandong Province during the Longshan period (3,000 – 2,000

BC) (Fairbank, 1992; Schirokauer et al., 2006), it was not until the middle part of the Zhou Dynasty (1046 – 256 BC) that a formal national system of education emerged in China (Zhou, 2005).

Spanning nearly 800 years, the Zhou Dynasty, which is commonly divided into two historical periods; the Western Zhou (1046-771 BC) and the Eastern Zhou (770-249 BC), was the longest continuous dynasty in China's history, and it was during this time that China developed much of the cultural foundation that was to pervade Chinese educational systems and educational perspectives for the next 3,000 years (Schirokauer et al., 2006).

The emergence of the first government-sanctioned colleges, primary schools and private schools occurred during the Eastern Zhou period, and it was during this time that the “National University” and the “Dictorate of Education” were developed (Zhou, 2005). Dedicated to the study of law, education, and calligraphy, these schools were primarily devoted to producing intellectually homogenized scholars for government posts; civil servants, and regional officials (Schirokauer et al., 2006; Zhao, 2014). It was also during the Eastern Zhou Dynasty that K'ung-fu-tzu (孔夫子 [Confucius]) wrote treatises on political theory, law, philosophy, ethics, and education and became the most influential figure in Chinese educational and cultural history (Csikszentmihalyi, 2005; Zhao, 2014).

While slight modifications to this paradigm were implemented in subsequent dynasties, this early model, emphasizing hierarchical conformity, academic memorization, and recitation largely remained the foundation of formal Chinese education for the following 2,500 years (Zhao, 2014).

In 587 (Sui Dynasty, 581-618), the first national exam, the “Imperial Civil Examination System” was developed as a *de facto* entrance exam for civil service. This national exam, which was used in its original format for over 1,300 years (Starr, 2010; Zhou, 2014), served as the philosophical prototype for China's modern Gaokao (高考 National

Education Exam) (Zhou, 2005; Zhao, 2014). The emphasis on classical works at this time resulted in an educational system that was strongly rooted in Confucianism, with a major focus on moral education and studies of integrity. The standard curriculum consisted of Confucius's "The Four Books"; "The Five Classics"; and "The Thirteen Classics", with some inclusion of Buddhism studies, and Taoism (Fukuyama, 1995).

While broad curriculum modernization efforts took place throughout the 19th and 20th centuries, much of the Chinese education culture remained philosophically, attitudinally and operationally rooted in the classic paradigm (Zhao, 2014). According to University of Oregon's Yong Zhao, that while the classical Chinese focus on outcomes produces exceptional test-takers, it effectively undermines creative approaches, critical thinking and innovative problem solving; considered essential skills within the Western classroom (Zhao, 2014). Zhao asserts that the Chinese emphasis on memorization, accurate performance in examinations, academic conformity, compliance, and homogeneous thinking, becomes a serious barrier to Chinese students transitioning into Western systems, often resulting in acute academic stress and pressure (Zhao, 2014).

A common thread, gleaned from the works of Chan (1999), Duff (2001), Ho and Crookall (1995), Li (2003), Lu (1990), Mohan (1985), Stephens (1997), Zhang (2001), Zhang (1999), and Zhao (2014) is revealed in the tendency of Chinese students toward academic and social rigidity. These authors agree that the Chinese classroom is characterized by rote memorization exercises, repetition, and very little encouragement of independent thought, intellectual curiosity or questioning (Chan, 1999; Duff, 2001; Zhao, 2014).

In his collection of scholarly writings, *The Analects* (論語), Confucius emphasized the importance of study and education and focuses on the proper development of Chinese character, life, learning, ethics, behavior and society. These elements are infused with a sense of conservatism, harmony and respect that formed the basis of Confucian teachings,

and these tenets are pervasive throughout Chinese politics, business and interpersonal relationships (Chan, 1999; Duff, 2001; Zhao, 2014).

As such, what westerners might perceive as timidity or resistance to interaction in Chinese students, may simply be the manifestation of the cultural expectations of respect and conservatism. Indeed, Li suggests that Chinese students' general aversion to independent postulation or expression is the result of respecting the academic authorities. In other words, the teacher is not to be questioned, nor is the authority of the lesson debated, as this might cause a loss of face (liǎn 脸) or signal disrespect to both the teacher and the original author of the academic work or idea (Li, 2003).

The cultural adherence to unadulterated recitation in Chinese classrooms can become something of an obstacle, however, in western classrooms; specifically with regard to plagiarism (Rawwas et al., 2004; Song-Turner, 2008). Where the western student is encouraged to develop their own perspectives based on an academic reading of material, the Chinese student may consider it disrespectful to do so (Duff, 2001; Li, 2003; Stephens, 1997; Zhou, 2014). This perspective has been found to manifest itself in repeated cases of plagiarism in American programs of study (Stephens, 1997; WoleRen Education Report, 2014), and may constitute a major challenge to academic achievement in Chinese students studying at western institutions.

In direct opposition to the cultural valuation of conformity, familial and social hierarchy, and role-adherence, the United States has a cultural tradition of valuing the individual over the collective. As exemplified in the second paragraph of the United States Declaration of Independence (Jefferson, 1776): *original punctuation and spelling reflected

“We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. — That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, — That whenever any Form of Government becomes destructive of these ends, it is

the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness. Prudence, indeed, will dictate that Governments long established should not be changed for light and transient causes; and accordingly all experience hath shewn that mankind are more disposed to suffer, while evils are sufferable than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same Object evinces a design to reduce them under absolute Despotism, it is their right, it is their duty, to throw off such Government, and to provide new Guards for their future security. — Such has been the patient sufferance of these Colonies; and such is now the necessity which constrains them to alter their former Systems of Government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid world.”

This document served not only to declare independence from Great Britain, but to effectively establish a specific social and political order based in the supremacy of the citizen over his government. This highly individualized notion; that all men are equal; that it is the right and duty of a person or people to “throw off” an unjust government speaks to the inherent “American character” as one of independence, autonomy, individual rights, and equality at all levels of the social construct (Pratt, 1991). This paradigm represents something of a total reversal of the Chinese social perspective, and remains a deeply foreign concept to most East Asians (Fukuyama, 1995).

Notions of independence, democracy and individualism became deeply ingrained within early educational practice, particularly in the American Northeast, through the widespread use of Noah Webster’s *Blue-backed Speller*” (Bynack, 1984; Ellis, 1979). While known primarily now for his American English dictionary, Webster was an influential educator, reformer and abolitionist in early, post-revolutionary America (Snyder, 1990). His decidedly secular and uniquely American-focused texts on spelling (published 1783), grammar (published 1784) and civics (published 1785) became the fundamental curriculum of post-revolutionary American schoolhouses (Bynack, 1984; Ellis, 1979; Snyder, 1990). Webster’s insistence that American children should be educated through American works,

espousing American values of democracy and liberty had in effect shaped foundation of the American approach to education (Snyder, 1990).

While numerous American education theorists and reformers have influenced Webster's original approach, the foundational values of American independence and democracy have remained largely intact throughout its history (Snyder, 1990). Indeed, John Dewey, one of America's most revered and influential educational theorists of the 19th and 20th centuries considered democracy and American social values to be fundamentally inextricable from the American educational experience (Papas, 2008).

Because of the contrasting philosophies that underlie Chinese and American familial, social and political constructs, we see a divergence in both the social and educational models manifest therein (Fukuyama, 1995; Pratt, 1991). The central sociocultural and linguistic differences between the two cultures can be viewed by aligning each country with its various structural, linguistic and cultural characteristics in figure 4 below (Based on Hsu, 1985; Pratt, 1991; Triandis, 1989, 1994, 1995, 2012).

Country	China	United States
Official Language	Chinese (Mandarin)	English
Government	Communist	Democratic
Social Focus	Communal; collectivized, homogenized	Individualistic; independent, pluralistic
Family Structure	Group-oriented; dependent, multi-generational	Autonomous; generationally independent
Social Structure	Hierarchical; roles-based	Egalitarian
Individual Orientation	Responsive to authority	Questioning authority
Teaching and Learning Style	Conformist	Creative

Figure 3. Major cultural characteristics of China and the U.S., based on Chan, 1999; Chao, 1968; Fukuyama, 1995; Hsu, 1985; Pratt, 1991; Triandis, 1989, 1994, 1995, 2012.

Interestingly and not insignificantly, the Chinese and American cultures highly value the somewhat disparate characters that are attributable to the various subcategories of their societies. It is therefore not unexpected that a sense of disorientation and misunderstanding commonly occurs in the first-year Chinese student studying abroad in America.

As seen in figures 4 and 5 below, when viewed graphically, the divergence of the two cultures as they are expressed through skills and outcomes expectations within the respective education systems becomes quite distinct.

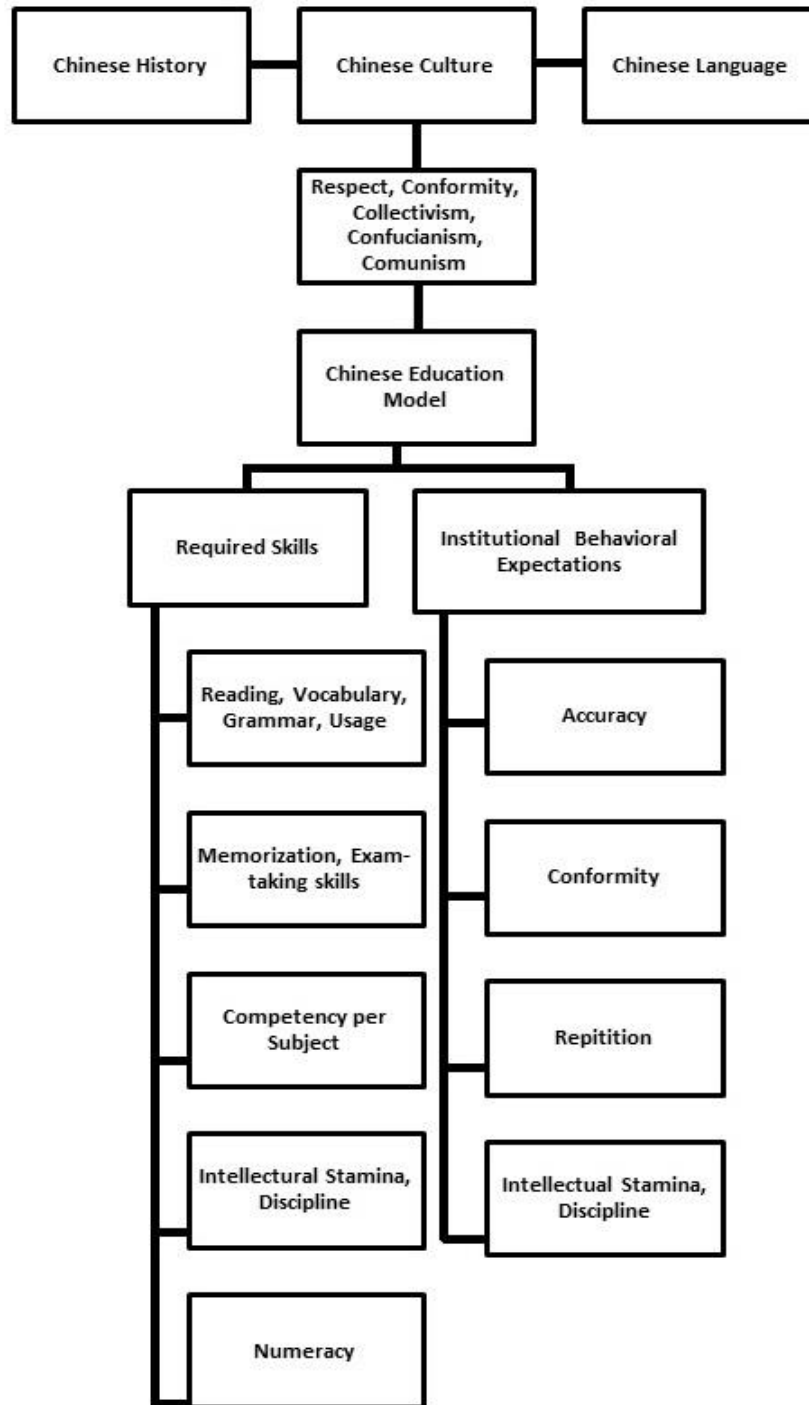


Figure 4. Cultural influences on education in China. Adapted from Agelasto & Adamson, 1998; Brewer & Chen, 2007; Brewer & Yuki, 2007; Carpenter, 2000; Chan, 1999; Gelfand et al., 2004; Hui & Triandis, 1986; Li, 2003; Liu, 2002; Salomon & Perkins, 1998; Starr, 2010; Triandis, 1995 Zhao, 2014; Zhou, 2005)

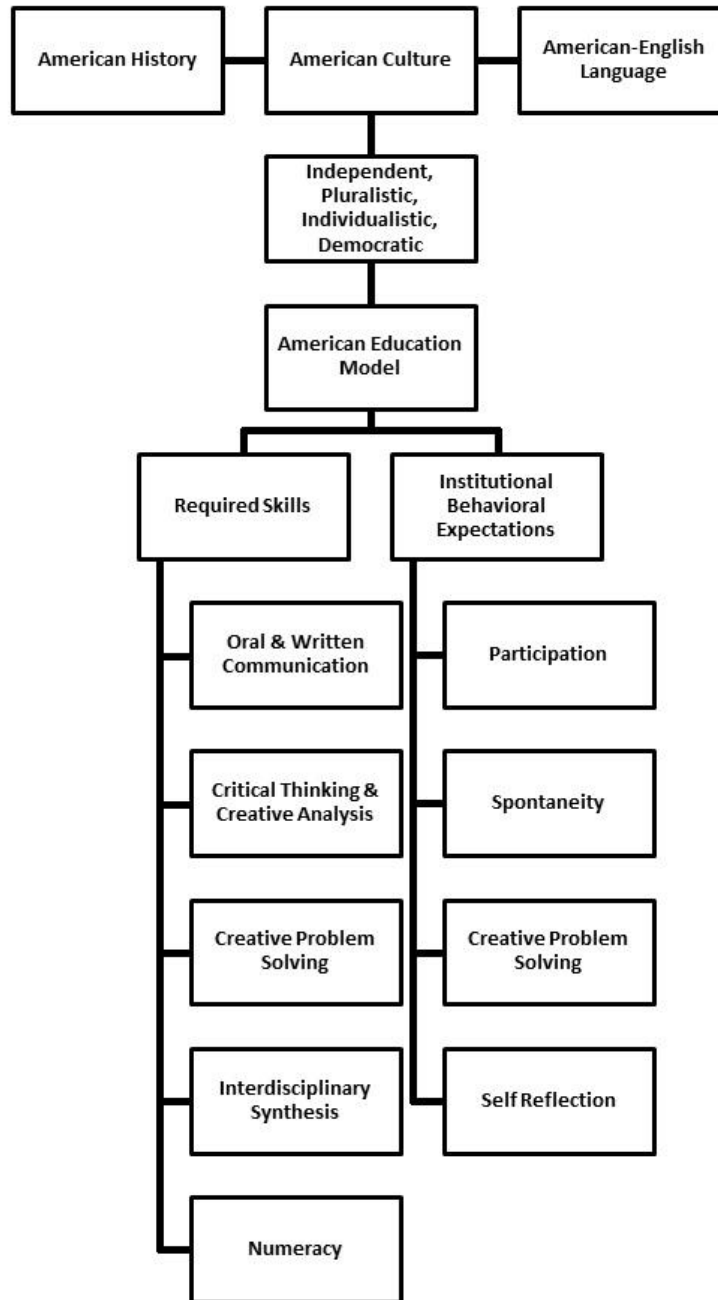


Figure 5. Cultural influences on education in the United States. Adapted from Altbach, 1998; Brewer & Yuki, 2007; Bynack, 1984; Chan, 1999; Ellis, 1979; Fukuyama, 1995; Gelfand et al., 2004; Hui & Triandis, 1986; Papas, 2008; Saloman & Perkins, 1998; Snyder, 1990; Triandis, 1995; Zhao, 2014.

The net effects of these sociocultural, linguistic and experiential variables contribute to the significant cultural distance between American and Chinese culture (Chan, 1999; Ho & Crookall, 1995; Li, 2003; Pratt, 1991; Triandis, 1989, 1995, 2012; Zhao, 2014).

Understanding the roots and manifestations of this cultural distance is essential to applying

Berry's theoretical model, and provides a vital context from which to approach the study of acculturation and acculturative process in Chinese international students (Berry, 1997).

Mandarin to English: The Linguistic Leap

A major contributing factor to cultural distance between China and the United States is manifested in linguistic differences (Li et al., 2010; Lowinger et al., 2014; Martirosyan, Hwang, & Wanjohi, 2015; Yeoh & Terry, 2013; Yuan, 2011). Language is considered a fundamental individual-level variable in both the moderation of the acculturation process, and in the manifestation of acculturative stress (Bai, 2015; Berry, 1974, 1989, 1990, 1995, 1997, 2005, Berry, Kim, Minde, & Mok, 1987; Du, & Wei, 2015; Lowinger et al., 2014; Tsu & Hsieh, 1996). Language serves as both a translation of personal experience within individuals, and the principal transmitter of experience between individuals (Hayes et al., 2001). It is the primary mechanism through which individuals create meaning, form context, and engage in interpersonal relationships in social groups (Berry, 1990; Berry & Annis, 1974). It both reflects and refracts culture, serves to unify individuals into broader social constructs (Hayes et al., 2001), and features within Berry's theoretical model as a primary variable effecting the acculturative process (Berry, 1997).

While the significance of language within cultural constructs is clear, it should likewise be noted that a single language does not always represent all members of a broad cultural group, nor do all distinct cultural groups within a country necessarily speak a common tongue (Triandis, 1964, 1989, 1995; Triandis & Gelfand, 2012). Contemporary China is comprised of 56 distinct ethnic groups (Tanner, 2010), and modern spoken Chinese includes thousands of local variants comprising at least seven major dialect groups (Chen, 1999). These dialect groups are often so divergent in phonological structure and vocabulary as to be mutually unintelligible to each other (Chen, 1999; Defense Language Institute report, 1974; Tang &

van Heuven, 2009). Nevertheless, in order to keep the current discussion within reasonable bounds, the focus of this analysis centers on Mandarin Chinese, also referred to as standard Chinese or Pǔtōnghuà (普通话 “common tongue”), which has served as the official lingua franca in China since 1932 (Chen, 1999), is the universal language of the Chinese national education system (Zhou, 2014), and is currently spoken by nearly 1 billion people (Chen, 1999).

The Chinese and English languages share no recent common linguistic ancestor, are geographically distant in origin, and derive from two distinct and evolutionarily dissimilar linguistic lineages (Defense Language Institute report, 1974). Stemming from the Sino-Tibetan language family, Chinese is characterized as a tonal, analytic, contextual, and logographic language (Chao, 1968). While similar to the Indo-European languages with respect to overall subject-verb word order (Defense Language Institute report, 1974; Yip, 1995) there are significant differences within the Chinese language, including vowel and consonant pronunciation, absence of subject-verb agreement, absence of verb tense and gender pronouns, absence of articles, absence of plural nouns, and differences in tone and inflection. (Chao, 1968; Yip, 1995). In addition, while it is possible to transcribe Chinese phonetically into pinyin (拼音) using phonographic letters of the Latin alphabet, native speakers invariably utilize Chinese characters; the original logographic system known as Hanzi (汉字) (Chao, 1968).

Pronunciation differences between the English and Chinese languages often negatively affects the overall intelligibility of Chinese international students’ speech and can lead to communication disruptions and language failures (Hansen, 2001; Jin & Liu, 2014, Yip, 1995). Furthermore, the anxiety that many Chinese internationals associate with English language pronunciation may lead to reduced intercultural engagement (Lueck & Wilson, 2010), social

isolation (Bertram et al., 2013), compromised self-efficacy (Lowinger et al., 2014; Lueck & Wilson, 2010), and lowered self-esteem (Wang et al., 2012). While daunting to many Chinese English-language-learners, such pronunciation-based errors are generally rooted in the fundamental differences in Chinese and English phonemes: singular sounds within a language which may have individual meaning or combine to form words (Hayes et al., 2001).

Related to phonemic pronunciation is the application of tone or inflection. Chinese is a tonal language in which the meaning of a word is defined by its specific tone (Chao, 1968; Defense Language Institute report, 1974). Standard Chinese consists of four tones and one atonal “neutral tone” which when applied to a phoneme distinguishes the meaning of the word itself (Chao, 1968). This contrasts sharply with intonation in the English language which is used to convey attitudes or emotion, but does not impart alternate meaning to the words themselves (Hayes et al., 2001).

A common example of how tone effects meaning in Mandarin Chinese is given in the tonal pronunciation of “ma” in figure 6 below.

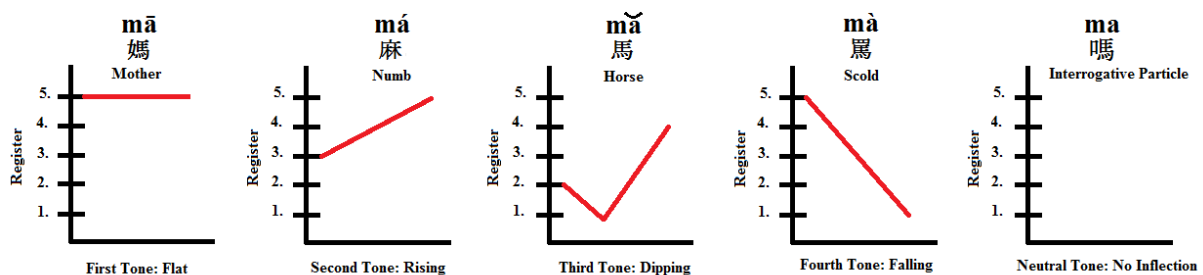


Figure 6. Effect of tonality on meaning in the spoken Chinese phoneme “Ma”

The differences in the use of tone between the Chinese and English languages may generate tonal confusion within Chinese international students, and has been shown to result in the overlay of Chinese tonal patterns onto English speech or the reduction of tonality

altogether (Ploquin, 2013). This may lead to listener-misunderstanding, most notably in the asking of questions (Jin & Liu, 2014). Both the accent and the tonality of Chinese-accented speech has been shown to contribute to cultural isolation, discrimination, and feelings of anxiety and depression in the speaker (Lueck & Wilson, 2010). Because of the significant linguistic differences in grammatical structure, written form, pronunciation, and tone between the Chinese and English languages, language deficiency appears as a fundamental component of acculturative stress in Bai's Acculturative Stress Scale for Chinese Students (ASSCS, Bai, 2015).

Academic Impacts of Language Barriers on International Students

Particular emphasis has been placed on the role of language-based challenges in international students from non-English speaking countries. Early research by Patricia Johnson at the University of Wisconsin-Green Bay showed a predictive correlation between TOEFL scores and academic performance (Johnson, 1988). These findings have been confirmed and replicated numerous times in the academic literature, including Robert Wicks' study on the effects of language proficiency on academic performance in international students (Wicks, 1996); Collette Mann and colleagues' research on the influence of language on academic performance in medical students (Mann et al, 2010); Li, Chen and Duanmu's "Determinants of International Students' Academic Performance" (Li, Chen & Duanmu, 2010), Salamonson et al.'s study of English-language acculturation and academic performance in ESL nursing students in Australia (Salamonson et al, 2007), and Nara Martirosyan, Eunjin Hwang, and Reubenson Wanjohi's recent "Impact of English Language Proficiency on Academic Performance of International Students" (Martirosyan, Hwang, & Wanjohi, 2015).

In consideration of linguistic impacts on international student performance and acculturative stress, it is prudent to keep in mind that not all ESL international students are

faced with overcoming the same degree of linguistic and cultural distance. It has been suggested by cross-cultural psychologist Harry Triandis that broadly similar linguistic and cultural groups (e.g., Italic/Romance languages/cultures; Sino-Tibetan languages/cultures) experience substantially less cultural dissonance and stress when transitioning within a related group than between non-related groups (Triandis, 1964, 1989, 1995; Triandis & Gelfand, 2012).

Recent research by Martirosyan, Hwang, and Wanjohi (2015) has shown that international students that speak multiple foreign languages maintain higher overall GPA's than international students that do not. Therefore, while language barriers may negatively impact sociocultural integration and academic performance in international students in general, it is helpful to also recognize that fluency in multiple languages and the specific linguistic/cultural groups from which the students originate appear to have effects on both acculturation and academic performance (Martirosyan, Hwang, & Wanjohi, 2015; Triandis, 1964, 1989, 1995; Triandis & Gelfand, 2012). Furthermore, it has also been suggested that fluency in multiple languages may be an indicator of intercultural/international interest or experience, and may correlate with heightened intercultural flexibility (Cleveland et al, 2011; Triandis, 1994). Accordingly, both the number of foreign languages spoken and international travel experience are queried within the current study in order to assess their potential relationship to acculturative stress.

Chinese International Students' English Language Proficiency and Academic Performance

Berry's theoretical model emphasizes the importance of language within the acculturative process (Berry, 1997), and researchers have shown that language proficiency has a direct impact on both social engagement (Lowinger et al., 2014; Sue & Zane, 1985; Tsu

& Hsieh, 1996; Wei et al., 2007) and academic performance in Chinese international students (Johnson, 1988; Spinks & Ho, 1984; Sue & Zane, 1985; Tsu & Hsieh, 1996).

Chinese citizens and political leaders have long understood that English proficiency and an understanding of western culture and business practice is beneficial to both the country and to any individual possessing this knowledge (Zhao, 2014). Chinese students are required to study English for a minimum of six years and will commonly have up to 15 years of English language study by the end of high school (Yang, 2004). Nevertheless, the level of English proficiency in Chinese students is highly variable, and those students with inadequate English language skills face specific academic challenges which affect both academic performance (Johnson, 1988; Spinks & Ho, 1984; Sue & Zane, 1985; Tsu & Hsieh, 1996) and levels of acculturative stress (Lowinger et al., 2014; Sue & Zane, 1985; Tsu & Hsieh, 1996).

These language-related academic challenges were explored in Spinks and Ho's 1984 research into English language proficiency and academic performance in the English-speaking/Western-oriented University of Hong Kong. In this study, a longitudinal analysis of 190 Mainland Chinese undergraduates revealed that English language and mathematics scores on the HKCEE entrance examination were highly predictive of academic performance (Spinks & Ho, 1984). The authors noted that the English language portion of the HKCC correlated strongly with the TOEFL examination, and that lower ESL scores in particular are predictive of lower overall academic achievement (Spinks & Ho 1984). Within the context of their study, Spinks and Ho identify English language proficiency as the most significant determinant of academic success at UHK, stating: "The canonical correlation analysis shows that English language measures emerge as the most important single predictors" (Spinks & Ho, 1984, p. 669).

Of particular interest is the fact that the students participating in the study were studying in Hong Kong; at the time a British-held territory, yet linguistically, culturally and historically a Chinese region (Star, 2010). Therefore, external acculturative obstacles would seem somewhat less of a factor than for sojourners to British or American institutions abroad. This may suggest that English language proficiency may predict academic performance at an English-speaking institution independently from acculturative stresses related to cross-cultural transition.

The connection between international students' academic performance and English language proficiency was further established by a study at the State University of New York, Albany by Dr. Patricia Johnson (Johnson, 1988). Johnson correlated undergraduate student TOEFL scores with choice of major and GPA, and found, like earlier work by Sue and Zane (1985), that TOEFL scores correlated with choice of major; with students who scored lower in the TOEFL gravitating toward STEM fields (Johnson, 1988; Sue & Zane, 1985). Goodson's study also supported Light, Xu and Mossop's (1987) findings in international graduate students, that TOEFL score is highly predictive of overall academic performance.

Johnson's work found support in later research by Yenna Salamonson and colleagues (2008) that measured English language acculturation via a validated English Language Acculturation Scale (ELAS, Salamonson et al., 2008), and correlated these findings with academic performance. Their study of 273 first-year international nursing students in Australia found that those with the lowest levels of English language acculturation also had the lowest mean subject grades. While the subjects were skewed female (77%), and represented a broad range of international origins, this study supports the hypothesis that language fluency is predictive of academic performance in international students in general.

Johnson's and Salamonson and colleagues' generalized approach to language fluency in international students as a broad group was subsequently adopted by Gang Li, Wei Chen and

Jing-Lin Duanmu in their research published in the *Journal of Studies in International Education* (Li, Chen, & Wei, 2010). Notably, however, Li, Chen and Duanmu took the additional step of analyzing Chinese international students as a discrete subgroup; comparing their data with the collective data for other international students (Li, Chen, & Wei, 2010). Li, Chen and Wei analyzed survey data in which 178 graduate students in the UK, 88 (49.4%) of whom were Chinese internationals, self-reported English language proficiency and their most recent test of English as a Foreign Language (TOEFL) scores, and correlated these with self-reported GPA (Li, Chen, & Wei, 2010). Their results pointed to writing difficulties as the predominant predictor of academic challenge, but also identified other correlates. Among these, the importance of learning success to family (the perceived importance of education within a student's family), and social communication with compatriots were found to be positively correlated with higher self-reported grades (Li, Chen, & Wei, 2010). The socialization with compatriots finding is rather surprising given the abundance of research supporting the hypothesis that increased *intercultural* (rather than intracultural) socialization is more positively adaptive in acculturative settings (Bertram et al., 2013; He, Lopez and Leigh, 2012; Lowinger et al., 2014; Pan and Wong, 2011; Wang, et al., 2012; Wei, Liao et al., 2012; Wei, et al., 2007; Yakunina et al., 2011; Yan & Berliner, 2011; Yuan, 2011; Yu et al., 2014; Zhang & Goodson, 2010). The authors suggest that the therapeutic effects of intracultural support may act as a stress-relief which promotes rather than detracts from academic performance (Li, Chen, & Wei, 2010).

In general terms, Johnson and Salamonson's finding, that language-based barriers are correlated with academic challenges in international graduate students, remain consistent with subsequent research by Nara Martirosyan, Eunjun Hwang and Reubenson Wanjohi on international undergraduates (Martirosyan, Hwang, & Wanjohi, 2015).

Martirosyan and colleagues' 2015 study, using self-reported language proficiency and institutional GPA across a broad and more generalized group of international students, showed a clear positive association between high self-reported English language fluency and mean GPA. One notable finding of this research was that students reporting fluency in three or more languages maintained the highest GPA of the sample (Martirosyan, Hwang, & Wanjohi, 2015). As previously noted, this indicates that fluency in multiple languages is positively correlated with academic performance, and, given the influence of language of the acculturative process, may be an important factor within acculturative stress.

In consideration of the positive association between multiple language fluency and academic performance, one cannot discount the possibility that multiple *dialect* fluency may also present a similar correlation. According to linguistic scholars, many of the Chinese dialects are mutually unintelligible (Chao, 1968; Chen, 1999; Defense Language Institute Report, 1974). Indeed, due to the vast differences in pronunciation and vocabulary between many Chinese dialects, some authors contend that speakers of multiple dialects should be considered multilingual (Chao, 1968; Chen, 1999; Defense Language Institute Report, 1974; Tang & van Heuven, 2009). Because the number of foreign languages a student speaks has been correlated with academic performance in international students (Martirosyan, Hwang, & Wanjohi, 2015), it may be reasoned that the number of Chinese dialects in which a student is fluent may be somewhat analogous to this, and should also be examined by the current study.

Summary

Chinese international students represent the largest and fastest-growing population of foreign students enrolled at American colleges and universities today (I.I.E. Open Doors Report, 2015). While representing a welcome source of revenue and cultural diversification for American institutions, the rapid growth of Chinese international students has not been without its challenges (Bartlett & Fischer, 2011; Stevens, 2012). The prevailing academic

literature has shown that cultural distance resulting from a variety of contrasting sociolinguistic characteristics between China and the U.S. lead to numerous acculturative challenges to Chinese international students (Bartlett & Fischer, 2011; Chan, 1999; He, Lopez, & Leigh, 2012; Jin & Liu 2014; Kim, Omizo, & Michael, 2005; Li, 2003; Liu, 2002; Lowinger et al., 2014; Lueck & Wilson, 2010; Ma, 2014; Martin, 1994; Rawwas et al., 2004; Song-Turner, 2008; Stevens, 2012; Wicks, 1996). In order to clarify and appropriately research these challenges, scholars from a broad range of academic disciplines have utilized acculturation theory to describe the various dynamics and stressors these students face (Bai, 2015; Barry, 2001; Bertram et al., 2014; Du & Wei, 2015; He, Lopez, & Leigh, 2012; Li, Chun, & Duanmu, 2010; Lin & Betz, 2009; Pan & Wong, 2011; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015; Wang et al., 2012; Wei et al., 2007; Yan & Berliner, 2013; Zhang & Goodson, 2011).

While previous research has explored acculturative strategy and the effects of acculturative stress in a wide range of intercultural migrants, the current study is the first of its kind to investigate acculturation strategy, acculturative stress and stress-related variables, and academic performance specifically in first-year Chinese international undergraduate students at an American college. This investigation into the acculturation dynamics within a very specific transitional period for these students is designed to shed light on acculturation processes and academic impacts in this highly distinctive student cohort.

John Berry's seminal 1997 article: *Immigration, Acculturation and Adaptation* describes a theoretical framework for acculturation research which has been cited over 5,000 times in the academic literature (Google Scholar). Considered by many to serve as the cornerstone of acculturation research, this model describes both the process of acculturation and a systemic approach to conducting acculturation research in groups and individuals (Bai, 2015; Barry, 2001; Celenk & Van de Vijver, 2011; Sullivan & Kashubeck-West, 2015; Ward & Kennedy,

1999). Berry's model prescribes an overview of the historical and cultural-linguistic constructs of both the culture of origin and the culture of settlement in order to illuminate the degree of cultural distance between the two (Berry, 1997).

A review of these factors reveals a significant degree of cultural distance between China and the U.S., manifested in broadly dissimilar language, and the distinct cultural constructs of Chinese collectivism and American individualism (Brewer & Chen, 2007; Carpenter, 2000; Chan, 1999; Chen, 1999; Gelfand, et al, 2004; Hui & Triandis, 1986; Starr, 2010; Triandis, 1994, 1995; Triandis & Gelfand, 2012). These cultural contrasts are reflected in the respective approaches to education in the two countries and result in highly disparate institutional expectations of student skills and behaviors (Chan, 1999; Zhao, 2014; Zhou, 2005).

As predicted by Berry's model, such cultural distance impacts the acculturative process in Chinese international students, resulting in a suite of related stressors, including language barriers, social isolation, perceived discrimination, academic pressures, and anxiety regarding feelings of guilt toward the family (Bai, 2012, 2015; Berry, 1997).

The academic literature has identified numerous variables associated with acculturative stress, including language fluency, education level, number of languages spoken, intercultural socialization, family communication, acculturation strategy, and phase (Bai, 2015; Barry, 2001; Bertram et al, 2014; Chan, 1999; Chen, 1999; Du & Wei, 2015; Hansen, 2001; He, Lopez, & Leigh, 2012; Kline & Liu, 2001; Li, Che & Duanmu, 2010; Lin & Betz, 2009; Lowinger et al. 2014; Ma, 2014; Martirosyan, Hwang, & Wanjohi, 2015; Pan & Wong, 2011; Salamonson et al, 2008; Spinks & Ho, 1984; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015; Triandis, 1995; Wang et al, 2012; Wei et al, 2007; Wei et al, 2012; Yan & Berliner, 2013; Zhang & Goodson, 2011) . Based upon suggested relationships between pre-acculturative experience and acculturative process, seven novel possible explanatory

variables are also introduced here: (1) Number of Chinese dialects spoken, (2) number of foreign languages spoken, (3) international travel experience, (4) household income, (5) parents' education level, (6) number of close American friends, and (7) previous visits to the U.S. (international travel experience).

Taken together, the interplay between acculturative stressors and related explanatory variables influence an individual's overall level of acculturative stress, and potentially, their academic performance (figure 7).

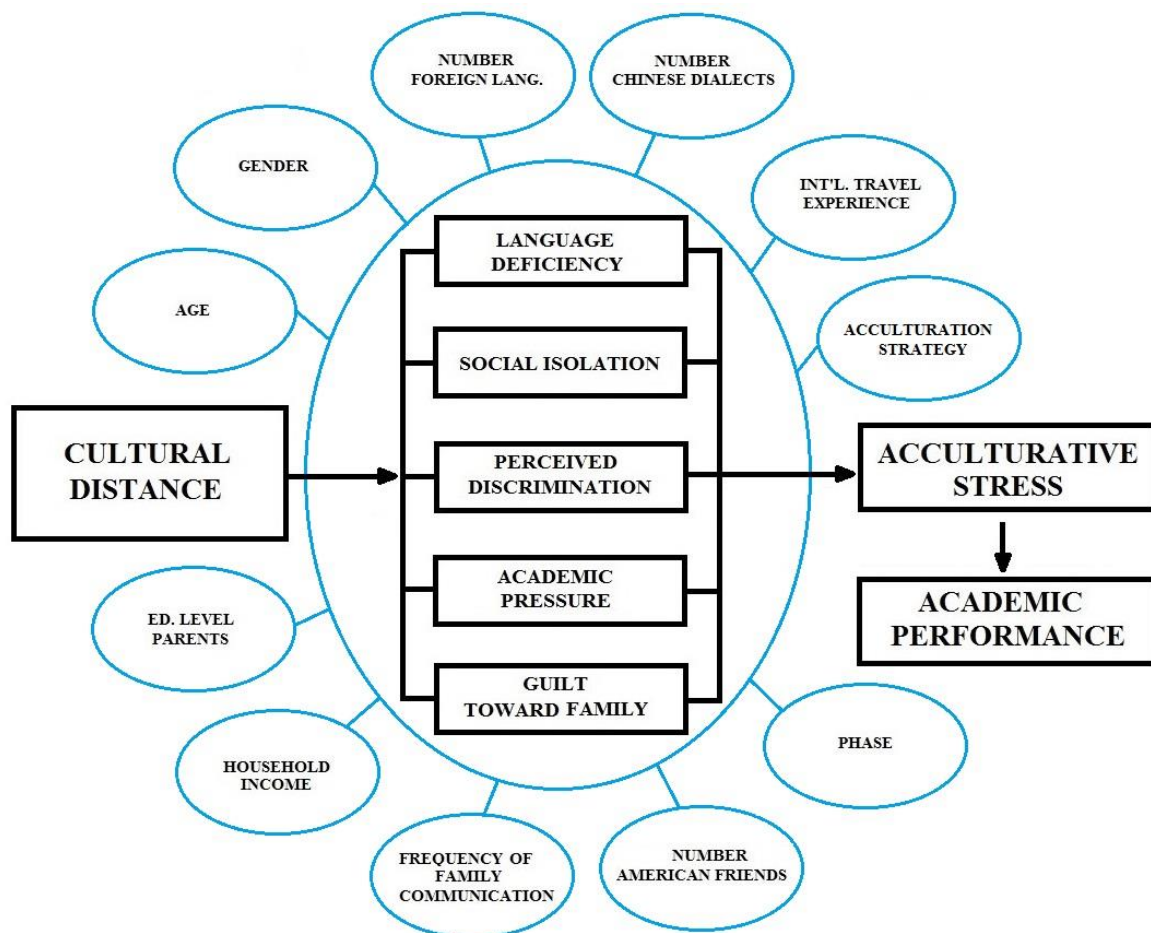


Figure 7. Acculturation, acculturative stress and academic performance: variables and outcomes map for first-year Chinese international students.

The preceding graphic depicts a consolidated acculturative process flow and variables map in first-year Chinese international students, with cultural distance manifesting in the acculturative stresses of language deficiency, social isolation, perceived discrimination,

academic pressure, and guilt toward family. These stressors have been confirmed within the research literature, and are captured within Bai's Acculturative Stress Scale for Chinese Students (Bai, 2012, 2015). Select explanatory variables are depicted within the blue oval shapes encircling the periphery of the central stressors. This study seeks to explore the connections, if any, between acculturative stress and downstream academic performance in first-year Chinese international students. It further seeks to uncover relationships between select explanatory variables and the response variable of acculturative stress.

Chapter 3: Methodology

The ensuing chapter provides an outline and justification of the research questions and hypotheses; drawn from and supported by the selected theoretical model, and empirical evidence within the field of acculturation research. This is followed by the rationale for selecting the research design of the current study, and a detailed discussion of the subject population, sampling methods and protocols. Finally, a review of the survey instruments, data collection procedures, data analysis, reliability, generalizability, and threats to validity, and ethical considerations is presented.

Research Questions

The primary purpose of the current research is to identify and evaluate acculturation strategy, acculturative stress and stress-related (explanatory) variables in first-year Chinese international students, and to correlate levels of acculturative stress with academic performance. The specific questions to be addressed by this research include:

- I. What is the most common acculturation strategy adopted by first-year Chinese international students at an American college?
- II. To what extent does acculturative stress relate to academic performance in first-term Chinese international students?
- III. To what extent do the number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, parent's level of education, household income, frequency of family communication, number of American friends, and phase (time spent in the US) correspond with acculturative stress and GPA in first-year Chinese international students at an American college?

The questions addressed by this research are guided by the fundamental theoretical framework of acculturation theory, and are borne out of an extensive review of the research

literature pertaining to the acculturation process, acculturative stress, and the potential effects of proximal demographic variables in Chinese international students.

This study is designed to provide a descriptive paradigm which illustrates first-year Chinese international Undergraduates' most common acculturation strategies, and the association between acculturative stress and academic performance in this particular group. It is further intended to identify significant relationships, if present, between the various explanatory variables suggested by the academic literature, and the response variable of acculturative stress. Variables which have either been directly identified by or suggested by previous research and are included in this study include number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, acculturation strategy, education level of parents, approximate household income, frequency of family communication, social interaction with Americans (captured here in survey question 13: Number of American friends), and phase (a combination of time in the U.S. since matriculation and survey question 8: How many times have you been to the U.S. before you came to study here?), are explored with regard to their relationship to acculturative stress. It is hypothesized that:

- I. The majority of first-year Chinese international Undergraduates adopt the acculturation strategy of separation.
- II. The level of acculturative stress that an individual experiences is inversely correlated with academic performance.
- III. Speaking multiple Chinese dialects and foreign languages has an association with reduced acculturative stress and higher first-year GPA in the student sample.
- IV. Previous international travel experience is associated with reduced levels of acculturative stress.

- V. Advanced education level of parents is associated with lower levels of acculturative stress and higher first-year GPA in the student sample.
- VI. Higher household income is associated with lower acculturative stress and higher first-year GPA.
- VII. Increased frequency of family communication is associated with lower levels of acculturative stress.
- VIII. Increased number of American friends is associated with lower levels of acculturative stress.
- IX. Increased phase (time in the U.S., as captured in multiple U.S. visits) is associated with lower levels of acculturative stress.

The following section outlines the rationale for each hypothesis, based on empirical evidence within the research literature and the guiding principles and assumptions of Acculturation Theory.

Hypothesis I, Acculturation Strategy: Acculturation Theory predicts that intercultural migrants will assume one of four acculturation strategies (assimilation; integration; separation; marginalization), based on their desire to retain/adopt or reject the cultural norms of their culture of origin and their culture of settlement (Berry, 1997). Numerous cross-cultural studies indicate that Chinese international students exhibit a strong pattern of in-group socialization and limited intercultural interaction (Kim, Omizo, & Michael, 2005; Lin & Betz, 2009; Liu, 2002; Lowinger et al., 2014; Stevens, 2012). While Kline and Lui's study on acculturation strategy in a mixed group (Chinese international undergraduates and graduates) found them to adopt an acculturation strategy midway between separation and integration (Kline & Liu, 2005), it is nevertheless hypothesized that first-year Chinese international undergraduates will primarily exhibit a separation acculturation pattern, consistent with the majority of findings in the academic research.

Hypothesis II, Acculturative Stress and Academic Performance: Stresses related to acculturation have been shown to impact academic performance and cognitive function in a variety of intercultural migrants (Berry, 1980, 1990, 1994, 1995; Glass & Westmont, 2012; Li, Chen & Duanmu, 2010; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015; Stone, Feinstein, & Ward, 1990; Ward & Rana-Deuba, 1999). While there is no previously-existing study which correlates acculturative stress with academic performance specifically within first-year Chinese undergraduates, the current study predicts that students reporting the highest levels of acculturative stress will show an overall lower GPA than those with very low levels of acculturative stress.

Hypothesis III, Number of Languages and Dialects Spoken: Research by Martirosyan, Hwang and Wanjohi has shown that the number of foreign languages spoken by an international student is predictive of positive academic performance (Martirosyan, Hwang, & Wanjohi, 2015). Because academic pressure is an essential component of Bai's Acculturative Stress Scale for Chinese Students (ASSCS), multiple language fluency is predicted to be associated with low higher academic achievement and lowered acculturative stress. Furthermore, as Chinese dialects are often so divergent as to be analogous to discrete languages, the current study predicts that an increased number of Chinese dialects spoken by an individual will be associated with lower levels of acculturative stress and higher academic achievement.

Hypothesis IV, International Travel Experience: Works by Cleveland and colleagues suggest that fluency in multiple languages may predispose intercultural migrants to greater cultural flexibility during cross-cultural transitions (Cleveland et al, 2011). They further suggest that fluency in multiple languages may be an indicator of an interest in or experience with international travel, and that this interest or experience may have a mitigating effect on culture shock (Cleveland et al, 2011; Triandis, 1994). It is hypothesized then, that students

who report previous international travel, defined as visitation to ≥ 2 separate countries outside China, will exhibit lower levels of acculturative stress than those who do not.

Hypothesis V, Education Level of Parents: Acculturation Theory emphasizes the importance of moderating factors, both prior to and during the acculturation process (Berry, 1997). Among the variables noted in Berry's model, education level is considered a key factor in moderating acculturative process and stress (Berry, 1997). While the students within the current sample are relatively uniform with regard to education level, the education level of the students' parent(s) is not so. Because of the primacy of family within the Chinese social construct, it is considered likely that parental influence on children's outlook, attitudes and experiences is significant (Chan, 1999; Fukuyama, 1995; Kim, Omizo, & Michael, 2005). For this reason, it is hypothesized that the education level of parents is to some degree reflected in the outlook, attitudes and experiences of their children, and may have some impact on acculturative stress and academic performance. It is therefore hypothesized that higher education levels of parents is associated with lower levels of acculturative stress in the students.

Hypothesis VI, Household Income: Among the many variables identified within the literature as impacting generalized stress in international students, financial pressures appears regularly (Bai, 2015; Du & Wei, 2015; Li & Duanmu, 2010; Sandhu & Asrabadi, 1998; Yan & Berliner, 2013). Research by Yan and Berliner shows that financial concerns have been associated with general anxiety, compromised feelings of wellbeing, and impaired cognitive function in international students (Yan & Berliner, 2013). Furthermore, research into household income and student academic performance in a broad range of student cohorts shows a strong positive correlation between a family's financial status and student academic performance (Fadem, Schuchman, & Simring, 1995; Hahs-Vaughn, 2004).

Chinese international students are largely funded by their parents/family members; are generally not permitted to work in the U.S., receive no federal financial aid support, and are typically not considered for institutional scholarship awards (WoleRen Education Research Center, 2014). It follows that international students' families often carry a substantial financial burden. Based on the correlation between household income and academic performance, and a further recognition of the potential for household income to act as a mitigating influence on financial stress, it is predicted that higher household income will be associated with lower levels of acculturative stress in Chinese international students.

Hypothesis VII, Frequency of Family Communication: As established through a review of the sociocultural foundations of Chinese educational practice and structure, family connectedness, obligation and reverence serve as fundamental cornerstones of Confucian ideology (Chan, 1999; Fukuyama, 1995; Starr, 2010). In reviewing the nature of Chinese family, social, and educational structures, a pattern of collective social identity emerges (Chan, 1999; Fukuyama, 1995; Starr, 2010; Triandis, 1995). While contrasting sharply with the American standard of individualism, collectivist cultures place a great emphasis on family as the primary social unit (Chan, 1999; Fukuyama, 1995; Starr, 2010; Triandis, 1995).

In 2005, Kline and Liu showed a positive correlation between regularity of family communication and reduced acculturative stress in Chinese international students (Kline & Liu, 2005), yet their sample was somewhat more broad than that of the current research. Acknowledging their research, and the overall cultural emphasis on familial connectedness, the current study predicts that increased family communication will be associated with lower levels of acculturative stress.

Hypothesis VIII, Number of American Friends: A wealth of acculturation studies have found that robust intercultural socialization with members of the host country acts to mitigate acculturative stress in international migrants (Bertram et al, 2013; He, Lopez, & Leigh, 2012;

Lowinger et al, 2014; Pan & Wong 2011; Wang, et al, 2012; Wei et al, 2012; Yakunina et al, 2011; Yan & Berliner, 2011; Yu et al, 2014; Yuan, 2011; Zhang & Goodson, 2010). This correlation has been firmly established in Chinese international students by numerous researchers, and is considered by this study as an important variable in the social isolation component of acculturative stress (Zhang & Goodson, 2011). As general indicator of intercultural socialization, the number of American friends reported is hypothesized to exhibit an inverse relationship with reported levels of acculturative stress.

Hypothesis IX, Phase: Acculturation Theory recognizes phase (time spent in the culture of settlement/migration) as an important moderating variable within the acculturation process, and predicts a reduction of acculturative stress with increased phase (Berry, 1990, 1995, 1997). Various studies have shown an inverse correlation between phase and acculturative stress (Bai, 2015; Berry, 1997; Kline & Liu, 2015; Wei et al, 2007). While the expected variance in phase among individuals in the current study is rather limited, it is hypothesized that those who report being in the country longer than others by virtue of multiple previous visits to the U.S. will show an associated reduced level of acculturative stress.

Research Design

The current study utilizes a quantitative correlational design using cross-sectional survey data to provide a paradigm of acculturative stress, stress-related explanatory variables, and academic performance in first-year Chinese international students. Drawing on Babbie (1990), Creswell (2009) defines survey-based quantitative research as providing, "...a numeric description of trends, attitudes, or opinions of a population by studying a sample of that population...with the intent of generalizing from a sample to a population." (p. 12). Unlike a purely qualitative approach to the description of experience, a quantitative model is readily available to statistical analysis (Smith, 1983). While the data retrieved is fully

dependent on the specific questions included in the survey tool, the quantitative research approach is bolstered by the ability to discretely measure and correlate independent variables with dependent variables.

The primary independent variable in this study was level of acculturative stress (measured as a continuous variable and then categorized), and the dependent variable was academic performance as manifested as first-year GPA. Additional explanatory variables within this study (research question three) included number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, acculturation strategy, education level of parents, household income, frequency of family communication, number of American friends, and phase (time in the U.S.)

The purpose of this study is to investigate the relationship between the independent variable of acculturative stress and the dependent variable of academic performance as measured by GPA. Additionally, the current research intends to explore the relationship of select explanatory variables with the response variable of acculturative stress.

This research relies on the analysis of existing data, collected over the past four years at Cambridge College. These data, gleaned from previous administrations of Bai's Acculturative Stress Scale for Chinese Students (ASSCS, Bai, 2012, 2015) and Barry's East Asian Acculturation Measure (EAAM, Barry, 2001), were formerly obtained by the School of Undergraduates Studies for the purposes of establishing baseline data, and for the potential of future analysis. While the results of these surveys have been available as recorded, no analysis of the data had yet been undertaken. For the purposes of this study, ASSCS and EAAM data were combined with existing demographic information and GPA to form the data pool for the current analysis. The previously administered surveys were conducted using instruments (ASSCS, EAAM) which had been translated into Mandarin Chinese (Hanzi, 汉字) to guard against potential language/fluency bias. The translations were conducted by a

professional bilingual (Chinese/English) translator in collaboration with the research director of this study in 2013. At that time, the Hanzi translations were then re-translated into English by a second independent translator and checked against the original survey instruments for accuracy. Survey data was collected during the spring term, and was correlated with first-year GPA data calculated at the end of the spring academic term.

Population and Sampling

The scope of the research is highly focused by design, and includes only first-year Chinese international undergraduates. This restrictive sampling, while limited with regard to its potential for extrapolation to experiences in subsequent academic years, is intentionally so. In order to provide the most accurate picture of a very specific transitional period in a precisely defined population, the sample does not include participants at other academic levels or cultural-linguistic backgrounds.

This research was conducted by analyzing the data from a sampling of four groups of first-year Chinese international students in the spring term of their first academic year at the School of Undergraduate Studies at Cambridge College (spring term, years 2013; 2014; 2015; 2016). Cambridge College is a medium-sized, private, regionally accredited (New England Association of Schools and Colleges; Massachusetts Board of Higher Education), open-enrollment institution located in Cambridge, Massachusetts. This site was selected primarily because the researcher's position as undergraduate dean at the institution affords access to the existing data sets for these students, firsthand knowledge of the student body, and direct coordination with the IRB Office.

The host institution differs from many traditional undergraduate institutions in that Cambridge College is an urban campus, with all students living off-campus in rented apartments or other living arrangements. Because students are not directly assigned housing by the institution, students have the opportunity to choose their roommate and living

situations. Considering that the nationality makeup of roommates may both reflect and influence social interaction and integration patterns of these students, the nationality composition of roommates was collected as a survey item (survey question 14, Appendix I).

The criteria for defining the population are based on an attempt to develop a well-defined sample that is specific enough to establish internal consistency, yet broadly generalizable to first-year Chinese international students at a less-competitive, non-residential American institution of higher education. While Cambridge College is classified as an open enrollment institution, the international student profile at Cambridge corresponds with Barron's criteria of qualified candidates for a "Less Competitive School" (Appendix F: Center for Public Education, 2015), representing the upper 65% of their class, with an overall high school GPA of 3.18 on a 4-point scale. The TOEFL iBT minimum requirement for the School of Undergraduate Studies is 79, which corresponds with more competitive institutions such as Central Michigan University, Clemson University, Florida Institute of Technology, and Northeastern University (American Exam Services data, 2016).

The total size of the sample for which there is pre-existing data is 128 students, (2012-2013=33; 2013-2014=28; 2014-2015=35; 2015-2016=32), and consists of 68 females and 60 males, representing 53.125% (f) and 46.875% (m) respectively. The average age of the sample was 18.257 years with a standard deviation of 0.55 years.

While the great majority of participants (83.594% [n=107]) were Bachelor of Science in Management candidates, first-year students at Cambridge College are largely enrolled in general education courses which are universal to all undergraduate majors. Therefore, while the majority of students represented in the existing data are Management majors, the coursework in which they enrolled was representative of the general education curriculum of all first-year fulltime students. This coursework is largely composed of writing courses, critical thinking-based coursework, and general education arts, humanities and sciences.

The following baseline profile is universal within the sample population for which data currently exists:

- I. Education/Educational Experience Level: Sample is composed of first-time, fulltime undergraduate students with no previous higher education enrollment/matriculation.
- II. Country of Origin/Citizenship: All sampled individuals originate from the People's Republic of China, and were/are studying on an F-1 visa. While Chinese language and culture are widely practiced in the PRC, Taiwan, and Singapore, and peoples across the globe identify as "Chinese", differences in cultural plurality between regions and countries have the potential to unduly confound the consistency of experience. Therefore, data analysis was restricted to those who originate from the PRC only.
- III. Native Language: Participants identified Mandarin Chinese as their primary language; having no previous extensive educational experience (≥ 1 year) within in the U.S. or other English-speaking country, and having attended both primary and secondary schools in China, in which Chinese was the primary language of instruction.

Data Collection

Cambridge College has a broad interest in developing data around the first-year experience in its international student body. To this end, all international students are invited to participate in surveys which may lead to a greater understanding of the challenges and stresses of the intercultural transition process within an academic setting. Various survey have been utilized in this regard, including pre-validated instruments that are tailored to a specific student subgroup (i.e., Chinese international students). In the case of narrowly-defined international student subgroups, nominal, ordinal, interval, and ratio survey data

collection are undertaken in real-time via information and survey sessions conducted in the spring term of the participants' first academic year. Academic performance and iBT TOEFL were provided by the Registrar's Office at the initiation of data analysis. These data are recorded on a standard 4.0-GPA scale. All surveys were recorded in Microsoft Excel, and tabulated by a student reference number.

Instruments

Nominal data of gender, age, academic major, number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, education level of parents, approximate household income, frequency of family communication with parents, number of American friends and national composition of roommates (if any) are gathered within the first 14 questions of the combined ASSCS/EAAM survey (Appendix I). High School GPA, iBT TOEFL score and first-year college GPA were obtained through the Student Records Office and the Office of the Registrar.

The two previously-developed Likert-scale survey tools follow. These include in order, Bai's Acculturative Stress Scale for Chinese Students in the United States (ASSCS; 32 items; Bai, 2015), and Barry's East Asian Acculturation Measure (EAAM; 29 items; Barry, 2001). Combined with the previous 14 demographic questions, a 75 item survey instrument served as the sampling instrument. Scoring of the survey data was conducted in accordance with the scoring values set by the tools' authors.

Bai's Acculturative Stress Scale for Chinese College Students in the United States (ASSCS) was specifically designed to measure acculturative stress in Chinese international college students in the United States (Bai, 2012, 2015). Consisting of 32 items, and encompassing five dimensions measuring language insufficiency, social isolation, perceived discrimination, academic pressure, and guilt toward family (Bai, 2012, 2015), this scale provides a clear model for developing data correlating acculturative stress with acculturation

strategy and academic performance in Chinese Undergraduates. The ASSCS has demonstrated high reliability (Chronbach's alpha = 0.94) and validity in predicting depression (Beta = 0.490, $p < .001$), and life satisfaction (Beta = 0.51, $p < .001$) (Bai, 2015). This instrument was originally created in both Chinese and English, and consistency and accuracy in translation.

Barry's East Asian Acculturation Measure (EAM, Barry, 2001) was designed to assess East Asian immigrants' acculturation strategy using Berry's (1997) fourfold acculturation model (subscales: assimilation; separation; integration; marginalization). The instrument utilizes a total of 29 items, measured on a seven-point Likert scale (strongly disagree; disagree; disagree somewhat; neutral; agree somewhat; agree strongly). Validated with a sample of 150 (75 male; 75 female) nonclinical participants of East Asian origin, the EAAM showed internal reliability for the four subscales with Cronbach's alphas ranging from 0.74 to 0.85 (Barry, 2001). Barry's instrument was translated into Chinese by an independent professional translator, then re-translated into English by a second translator to check for consistency and accuracy.

Procedures

Each August, in an ongoing basis, potential survey participants are identified through the International Students Office based on the specificity of existing survey instruments (in this case Chinese students). A list of names and contact emails is developed for the purpose of identifying specific international student subgroups, introducing the surveys, and an informal invitation to participate (Appendix F). Students were introduced to the format and purpose of the survey by the primary investigator during the international student orientation in the first week of the fall term. During orientation, Chinese international students were given an information sheet about the ASSCS and EAAM surveys, and interested candidates were given the opportunity to place their name and contact information on a potential candidates

list (Appendix G). All others were informed that should they become interested later, they would be welcome to join the study anytime within the fall term of that academic year.

A second email of introduction to the study, its purpose and potential applications was sent to all qualified students during the midterm of the fall term, along with an invitation to participate (Appendix H). Additionally, the primary investigator regularly met with the leadership and members of the Cambridge College Chinese Students group to encourage participation.

Within the recruitment emails, candidates were assured of individual confidentiality in the collection and any subsequent analysis of the data. Furthermore, participants were informed that the anonymous, generalized results of the study may be shared with participants, upon request, subsequent to data analysis. In addition, the findings are to be shared and discussed with the school's International Students Office, along with recommendations for any indicated actions or supports.

Each year, three information and survey/consent sessions were held on campus. These sessions were designed to meet with potential participants, explain the scope and intent of the surveys, establish consent, and to conduct the survey. These information/survey sessions are bilingual, with opportunities for potential participants to ask questions and to discuss applicability, anonymity, and the intended/potential use of the data. Students were given the direct contact email and phone numbers of the primary investigator in order to facilitate the answering of any subsequent questions or concerns.

The combined ASSCS/EAAM survey consists of demographic information variables of age, gender, academic major, number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, education level of parents, approximate family income, frequency of family communication, number of American friends, and

nationality makeup of roommates (does the student live primarily with Chinese, Americans or other foreign students).

Three information sessions and data collection dates were scheduled in March of the spring term of each academic year. Information and data collection sessions were held at the Cambridge College main campus. These one and a half hour sessions utilized the following format:

- I. Introduction to the survey: What we hope to learn and why. (5 minutes)
- II. Potential applications of survey: How can we help future groups of Chinese international students succeed in transitioning to the US? (5 minutes)
- III. Protection of anonymity, consent, and protection of data. (5 minutes)
- IV. Format of the survey (5 minutes)
- V. Questions and Answers (5 minutes)
- VI. Signing of consent forms and completion of survey (60 minutes)
- VII. Collection of survey and \$10 gift card (5 minutes)

Data Preparation & Analysis

The current study drew from pre-existing data sets that included data on the aforementioned constructs from first-year Chinese international students attending Cambridge College during the academic years of 2012-13, 2013-14, 2014-15, and 2015-16. The initial format in which the data were saved was Excel spreadsheets. The data were transferred from the Excel spreadsheets into an SPSS 24.0 data file. The data were then prepared and analyzed. The following sections describe the data preparation and data analyses conducted for this study.

Data preparation

The data were prepared and cleaned in accordance with recommendations from Osborn (2012). The data preparation first included a review of the dataset for missing data points; if

missing data points were found, they were to be imputed using linear interpolation imputation. The ASSCS and EAAM subscales were then prepared for analyses. Cronbach's alphas were calculated to determine the inter-item reliability of the ASSCS acculturative stress and EAAM acculturative stress subscales. The ASSCS and EAAM subscales were computed in accordance with Bai (2016) and Barry (2001), respectively, with further computation of the EAAM subscales into dichotomous variables. Finally, certain data were dummy coded per requirements of hierarchical multiple linear regression (Grömping, 2015).

Preliminary data analyses

Preliminary statistical analyses were performed for specific reasons. These reasons were (a) to describe the study sample, (b) to describe the study variables, (c) to test assumptions pertinent to analyses used in hypothesis testing, and (d) to assess the significance of relationships between participant variables and study variables, that is, to test for covariates. These analyses are discussed in the following sections.

Computation of descriptive statistics

The first set of data analyses included conducting descriptive statistics on participant demographic, academic, family and friend social support, living arrangement, foreign travel, and foreign language knowledge. For categorical variables (e.g., gender, college major, current living arrangement), frequencies and percentages were computed. For continuous (e.g., interval and ratio) variables (e.g., high school GPA, first-year GPA), the mean, standard deviation, and minimum and maximum scores were calculated. The second set of data analyses involved computing the descriptive statistics for the ASSCS and EAAM subscales, with the means, standard deviations, and minimum and maximum scores of subscales computed¹.

¹ The EAAM acculturative strategies categories were computed as part of the data analysis for the first research question.

Testing of assumptions

The third set of analyses consisted of the testing of assumptions. Inferential statistics, including various types of linear regression models, require that data meet certain assumptions so that statistical findings are valid (Nimon, 2012). All inferential statistics have assumptions of the data that must be tested (Darlington & Hayes, 2016; López, Valenzuela, Nussbaum, & Tsai, 2015; Osborn, 2012). Adjustments to the data, to the proposed statistical analysis, or to both must be made if tests uncover violation(s) of assumptions (Darlington & Hayes, 2016; López et al., 2015; Osborn, 2012).

Five assumptions were tested with regard to the ASSCS subscales and total scale and the EAAM subscales. The first assumption was that study variables were measured without error; Cronbach's alphas provided information regarding this assumption. Cronbach's alphas determine inter-item reliability; a Cronbach's alpha between .70 and .79 are considered good, between .80 and .89 are considered very good, and .90 and higher, excellent (Tavakol & Dennick, 2011). The second assumption tested was normality in the distribution of scale scores. Normality was tested by computing z_{skewness} scores (i.e., skewness divided by skewness standard error; Ghasemi & Zahediasl, 2012) and comparing these scores to the critical z_{skewness} value of ± 1.96 . Values under 1.96 signify that the variable data show minimal skewness and display normality within acceptable limits (Ghasemi & Zahediasl, 2012; Osborn, 2012, 2013).

The third assumption tested was lack of multicollinearity. Lack of multicollinearity is tested when a research question has more than one independent variable, and in some cases, when a research question or study has more than one dependent variable² (Grömping, 2015;

² The assumption of lack of multicollinearity between dependent variables is typically tested when conducting a one-way or factorial multivariate analysis of (co) variance (MAN[C]OVA), which collectively examines the influence of the independent variable(s) on more than one dependent variable (Warne, 2014). This assumption is also tested for dependent variables when they are conceptually analogous and measure the same or very similar construct. Results from inferential statistics, such as linear regression models, that test multicollinear dependent variables in separate analyses would be highly redundant (Grömping, 2015; Nimon, 2012).

Nimon, 2012; Warne, 2014). A lack of multicollinearity assumes that independent variables and when relevant, dependent variables, measure distinct and conceptually different constructs that are not significantly associated with one another or are significantly associated with one another to a small to moderate degree (Grömping, 2015; Nimon, 2012). Two analyses are typically employed to test this assumption: correlational analyses (Pearson bivariate correlations are the most common correlational analyses) and the computation of variance inflation factors (VIFs) (Darlington & Hayes, 2016; Nimon, 2012). The general rule-of-thumb for lack of multicollinearity is if the bivariate correlation is $r < .80$, $p < .001$. However, correlations are influenced by sample size: a low correlation (with r s in the .10s) can be significant at $p < .001$ if the sample is large enough (Darlington & Hayes, 2016; Nimon, 2012). Statisticians (e.g., Darlington & Hayes, 2016; Nimon, 2012) therefore recommend that VIFs - which are computed by running numerous multiple linear regressions, with each variable entered as the dependent variable and the other variables entered as predictors - augment information provided by correlational analyses. The assumption of lack of multicollinearity is met if VIFs are less than 10.00 (Darlington & Hayes, 2016; Nimon, 2012).

The fourth assumption tested was little to no autocorrelation between regression residuals (e.g., the regression residuals (errors) are independent from one another), an assumption specific to hierarchical multiple linear regression (HMLR), multiple linear regression (MLR), and linear regression (LR) (Nimon, 2012; Osborne, 2013). The Durbin-Watson statistic is computed to determine if the assumption has been met; little to no autocorrelation is evident if the Durbin-Watson value is between 1.00 and 3.00 (Nimon, 2012; Osborne, 2013). The fifth and last assumption, which was also specific to linear regression models, was that data show homoscedasticity, that is, the variance of residuals (errors) is the same across all levels of the independent variables (Nimon, 2012; Osborne, 2013). Homoscedasticity is tested by

computing a scatterplot of the standardized predicted dependent variable by the standardized residuals of the predictors; if the data points fall equally above and below the zero line, the assumption of homoscedasticity is met (Nimon, 2012; Osborne, 2013).

Testing of covariates

There were numerous participant variables in this study that were likely to be significantly associated with the dependent variables of the study, and thus were considered covariates or confound variables. A covariate or confound variable is an extraneous variable whose presence affects the relationship between the independent and dependent variables being studied (Nimon & Oswald, 2013). To determine if any descriptive variables were significantly associated with the dependent variables of first-year GPA and acculturative stress, a series of Spearman's rho correlations were conducted. Spearman's rho correlations, which are the nonparametric equivalents to Pearson bivariate correlations (Darlington & Hayes, 2016), were conducted as many of the descriptive variables were categorically coded.

Data analyses for study research questions

The first research question was, 'What is the most common acculturation strategy adopted by first-year Chinese international students at an American college?' To address this question, a series of computations were conducted on the East Asian Acculturation Measure (EAAM) in accordance with recommendations by Barry (2001). The four EAAM acculturation strategy subscales - the 8-item assimilation subscale, the 7-item separation subscale, the 5-item integration subscale, and the 9-item marginalization subscale - were computed by summing the respective subscale items and dividing this summed value by the number of items in the respective subscale. This resulted in a mean scale score for each acculturation strategy.

The scales were then recoded as dichotomous variables, with 0 = score less than 3.50 and 1 = score greater than or equal to 3.50 in accordance with Barry (2001). As the analyses were conducted separately for each acculturation strategy, participants could be placed into more than one strategy category. To identify which acculturation strategy was adopted by students based on their highest score across the four strategy categories, a new acculturation strategy variable was computed.

For Research Question two (RQ2) analysis of variance (ANOVA) was utilized to analyze the data. Specifically, the independent variable of acculturative stress (IV) was categorized into Low-Stress, Moderate-Stress, Above-Average-Stress, and High-Stress and a one-factor ANOVA was run with GPA serving as the dependent variable (DV) and using $\alpha = .05$ for significance tests. Tukey's HSD post hoc procedures were performed on any significant independent variable in the analysis that had more than 2 levels. Prior to interpretation of the results, ANOVAs assumptions were assessed and no violations were found.

Two separate hierarchical multiple linear regression (HMLR) analyses were conducted to address the third research question; "To what extent do the number of Chinese dialects spoken, international travel experience, parent's level of education, household income, frequency of family communication, and number of American friends correspond with acculturative stress and GPA in first-year Chinese international students at an American college?" HMLR analyses were conducted as covariates were entered first, on the first model of the HMLR, followed by the independent variables on the second model of the HMLR. The control of covariates statistically allowed the true relationship(s) between the independent and dependent variable to emerge (Nimon & Oswald, 2013). HMLR results provide information regarding the overall regression model(s) as well as the specific predictors. In this study, regression model significance was determined by the model F and associated significance (p) value, with significance set at $p < .05$. The effect size of the

model was determined by the model R^2 . The significance of the individual predictor was determined by the standardized beta coefficient β and associated significance (p) value, with significance set at $p < .05$.

Validity, Reliability, and Generalizability

In order for data to have any practical value to the research community, it must be considered reliable and valid (Creswell, 2009). All survey-based research is subject to internal threats to validity related to the structure of the survey tool, the sample population, the time at which the survey was conducted, and other factors (Fowler, 2002; Rosenthal & Rosnow, 1991). The primary goal of the researcher then is to construct or employ a survey instrument and sampling procedure which minimizes these threats (Rosenthal & Rosnow, 1991). In general, Likert-scale instruments have been shown to provide a reliable format for gathering self-reported data which can then be ordered and statistically analyzed (Creswell, 2009). Of the notable limitations of Likert-style surveying, however, is the potential for irrelevant questioning, omitted perspectives, and assumptions of generalizability (Miller, 1991)

While a robust body of research exists attesting to the importance of the variables being investigated here, there are certain points of potential bias that must be considered. First, although each survey instrument has been externally validated, their use together in a singular instrument is novel. The overall increase of questions within the conjoined survey may have the potential to affect the type of answers recorded (Rosenthal & Rosnow, 1991). While the author considers this outcome unlikely, it is nevertheless important to mention that it has been contemplated.

An additional point of consideration is the self-selection of participants. Because participation in the survey is fully voluntary and involves access to academic records, participants with academic challenges may be reluctant to participate. One potential

corrective approach could be to calculate the overall GPA for all first-year Chinese students at the institution (unidentified by individual student), and compare the overall data with the sample. This would require additional data access permissions through the IRB Office, but may be considered a worthwhile protection of the validity of generalization.

The instruments created by Bai (Bai, 2012, 2015) and Barry (Barry, 2001) are considered reliable tools for measuring the variables for which they are designed to investigate.

However, in each case, the instrument is designed to record real-time/concurrent experience without historical context. In other words, while Bai's tool asks questions related to feelings of discrimination (e.g., Q 14. "I feel others are biased toward me"), there is an inherent assumption that the individuals responding to this question did not feel a sense of discriminatory bias while in China. Additionally, questions of social anxieties, language limitations, and other variables do not specifically identify the participants' previous experiences in China. It is entirely possible that a participant may have had a limited social life or felt anxiety about a limited vocabulary back at home, in their native language. This design limitation is consistent with Barry's EAAM, which does not inquire about previous patterns of social behavior.

While numerous studies presented in this work show a clear correlation between language proficiency and academic performance, it is important to note that, like the current research, none of the previous studies investigate the students' previous academic performance in their home country/language. It is therefore important to point out that while numerous studies correlate academic challenges with language proficiency, and indeed assume some causal relationship (Li et al., 2010; Lowinger et al., 2014; Martirosyan, Hwang, & Wanjjohi, 2015; Yeoh & Terry, 2013; Yuan, 2011), it is entirely possible that academic challenges may have pre-existed within the student before the migration.

It is with this understanding that the current research is limited with regard to drawing direct causal relationships. Further adaptation of the existing tools would need to be undertaken to further clarify causality.

Ethical Considerations

This study involves the use of self-reported information about psychological states and attitudes, family background and other potentially sensitive information. Furthermore, institutionally-reported academic performance data was accessed in the context of this research. It is therefore essential that the identities of all survey participants be fully protected, and that the use of pre-existing data in no way violates the scope of proposed uses when the data was collected. A review of consent materials confirms that participants had been informed of rationale of the survey, its potential limited and extrapolated uses, the measures and assurances of confidentiality, and participants' individual rights. These considerations are presented in detail within the call to participate, as well as the pre-survey information sessions; with participants encouraged to ask any questions of concern in either private or in public fora. Consent forms include details of confidentiality, a copy of which was given to each participant.

Data used for this study was extracted from a wider database, was stored in a secure server on the campus of Cambridge College, and be available only to the researcher. Paper copies of completed surveys, once entered electronically into the database were destroyed by shredder. At no time was the data relating to this research linked to or associated with the personal identities of the participants. All communications with participants was held confidential and anonymous, as will any future requests for findings.

While the current study is designed to illuminate profiles of acculturation, acculturative stress and academic performance in first-year Chinese international students, it is not intended to provide direct diagnostic measures. Indeed, caution is recommended in drawing

causal links between the variables under investigation for reasons stated previously in the section on validity and generalizability.

Summary

This study is developed to provide a descriptive portrayal of acculturation strategy, acculturative stress, and academic performance in first-year Chinese international students. It employs data from validated and reliable survey instruments which have been combined in a novel way to investigate well-defined elements of the acculturative process within an academic and social setting.

It is the author's intent to make these findings available to the research community in order to advance our understanding of the various psychosocial and academic dynamics involved in acculturation in this specific cohort. It is hoped that the availability of these findings will contribute to a greater sensitivity within American institutions of higher education with regard to the development of bridge programming, student services, and academic support for this specific student population.

Chapter 4: Results

The overarching goal of this study, conducted with a sample of first-year Chinese international undergraduates who attended Cambridge College, was to address gaps in the acculturation literature pertaining to this specific student cohort. The study had three principal objectives: (a) to determine the predominant acculturative strategies (i.e., assimilated, separated, marginalized, and integrated) adopted by the students; (b) to assess the association between acculturative stress and academic achievement among students; and (c) to examine which demographic, foreign travel experience, living arrangement, and family and friend social support factors, if any, were significantly associated with acculturative stress and academic performance among first-year Chinese students. The broader purpose of this study was to provide a linguistic and cultural/psychosocial context from which acculturative strategies and stresses emerge; clarifying the foundations of Chinese student motivations, attitudes and behaviors within the American institution of higher education.

The purpose of this chapter is to present and discuss the findings from statistical analyses conducted for the study. After a brief review of how the data were prepared for analyses, descriptive statistics of the participant variables and the two primary study variables of acculturative stress and acculturation strategies are summarized and presented. The chapter then reviews the findings from preliminary statistical analyses, specifically, ANOVA analysis addressing research question two, and tests of assumptions and covariates for hierarchical multiple linear regression (HMLR), the inferential statistic used to address the third research question of the study. The study research questions are then addressed, and findings are summarized in the last section of the chapter. Tables and figures augment the text of the chapter.

Data Preparation

Participants completed the study survey during sessions held at the Cambridge College campus. The survey data were downloaded into an Excel file, then transferred to an SPSS 24.0 data file. The data set was first visually examined for any entry errors and missing data. No entry errors were found, nor were there any missing data. Once Cronbach's alphas were computed to test the assumption that study variables were measured without error (discussed in detail later in the chapter), the study variables related to acculturative strategies and acculturative stress were computed. To meet the data coding requirements of HMLR, certain variables were dummy coded, with explanations provided later in this chapter. Once these activities were completed, data were ready for analyses.

Descriptive Statistics: Study Participants

The total number of participants ($N=128$) represented a combined sample consisting of four groups of first-year Chinese international students attending Cambridge College during the academic years of 2012-13 ($n=33$, 25.8%), 2013-14 ($n=28$, 21.9%), 2014-15 ($n=35$, 27.3%), and 2015-16 ($n=32$, 25.0%). In addition to items measuring acculturative strategies and stress constructs, the study survey was comprised of demographic, foreign language and travel, living arrangement, and family and friend social support questions that were answered by students. Descriptive statistics were computed from the data gathered from the students. The descriptive statistics for categorically-coded variables included frequencies and percentages, while the descriptive statistics for continuously-coded variables included the mean, standard deviation, and minimum and maximum scores.

Descriptive Statistics: Demographic Questions

Students were first asked to respond to various demographic questions. The demographic variable descriptive statistics are presented in Table 1. The gender of students was relatively equivalent, with 60 (46.9% of) students being male and 68 (53.1% of) students

being female. The average age of participants was 18.30 years ($SD = 0.55$), with students' ages ranging from 17 to 20 years. The overwhelming majority ($n = 107, 83.6\%$) of students were business management majors; fewer students were accounting, psychology, early childhood education, and education majors (see Table 1 for specific frequencies and percentages).

Students were asked to provide their fathers' and mothers' highest level of education. Forty-five (35.2%) students reported that their fathers' highest level of education was a bachelor's degree, and slightly fewer ($n=40, 31.3\%$) of students stated that their fathers' highest degree was a high school diploma. Fewer students reported that their father's highest degree was a zhuanke ($n=21, 16.4\%$), a master's degree ($n=9, 7.0\%$) or a doctorate degree ($n=5, 3.9\%$). A small number ($n = 8, 6.3\%$) of students did not know the highest education level of their fathers.

The majority of students ($n=79, 61.7\%$) reported that a high school degree was their mothers' highest level of education, while almost a fourth of students ($n=30, 23.4\%$) reported a bachelor's degree as the highest level of education for their mothers. Fewer students reported as the highest level of education for their mothers a zhuanke ($n=12, 9.4\%$) and a master's degree ($n=5, 3.9\%$). Seven (5.5% of) students reported not knowing the highest level of educational attainment of their mother. No student reported having a mother who held a doctorate degree. Based on student data, mothers had lower levels of education as compared to fathers of students. A chi-square test of independence determined that mothers did in fact have significantly lower education levels than fathers, $\chi^2(12) = 112.88, p < .001$.

Table 1

Frequencies and Percentages: Demographic Questions (N = 128)

<i>Variable</i>	<i>n</i>	<i>%</i>
Gender		
Male	60	46.9
Female	68	53.1
Age		
17 years of age	5	3.9
18 years of age	87	68.0
19 years of age	34	26.6
20 years of age	2	1.6
College Major ^a		
Business Management	107	83.6
Accounting	4	3.1
Psychology	7	5.5
Early Childhood Education	3	2.3
Education	7	5.5
Highest Education Level of Father ^b		
High school degree	40	31.3
Zhuanke	21	16.4
Bachelor's degree	45	35.2
Master's degree	9	7.0
Doctorate degree	5	3.9
Don't know	8	6.2
Highest Education Level of Mother ^c		
High school degree	79	61.7
Zhuanke	12	9.4
Bachelor's degree	25	19.5
Master's degree	5	3.9
Don't know	7	5.5
Family Income Level ^d		
Low	35	27.3
Average	62	48.4
Above Average	23	18.0
Very High	8	6.3

Note. ^a Due to over 80% of students majoring in business management, the variable *college major* was not included in analyses. ^b For statistical analyses, the variable *highest education of father* was dummy-coded; three variables were computed, with the first variable comparing *fathers with a high school degree* to *fathers with a master's degree or higher*, the second variable comparing *fathers with a zuanke* to *fathers with a master's degree or higher*, and the third variable comparing *fathers with a bachelor's degree* to *fathers with a master's degree or higher*. ^c For statistical analyses, the variable *highest education of mother* was dummy-coded; two variables were computed, with the first variable comparing *mothers with a high school degree* to *mothers with a bachelor's degree or higher* and the second variable comparing *mothers with a zuanke* to *mothers with a bachelor's degree or higher*. ^d For statistical analyses, the variable *family income level* was recoded to 1 = low, 2 = average, and 3 = above average/high and was treated as an interval variable. Age was an interval variable and thus was not recoded.

Descriptive Statistics: Academic Achievement

Application records provided data on study participants' pre-matriculation academic achievement (high school GPA) and TOEFL scores. First-year academic achievement data (as captured by GPA) were retrieved from the office of the Registrar. Descriptive statistics on three variables of high school grade point average (GPA), TOEFL score, and first-year GPA are presented in Table 2. The mean high school GPA among participants was equivalent to a *B* grade ($M = 3.18$, $SD = 0.20$). High school GPAs ranged from 2.86 (equivalent to a *B-*) to 3.81 (equivalent to an *A*). The mean first-year college GPA of students was 3.17 ($SD = 0.23$), also equivalent to a grade of *B*, with GPAs ranging from 2.83 (equivalent to a *B-*) to 3.73 (equivalent to an *A*). The mean TOEFL score among students was 81.07 ($SD = 2.62$), and scores ranged from 77.00 to 88.00 points. The mean TOEFL score of 81.07 was significantly higher than the mean score of 78.00 reported by Recine (2016) for native Chinese speakers, $t(127) = 13.27$, $p < .001$, however, this is explained by the institutions' minimum TOEFL requirement of 79.

Table 2

Descriptive Statistics: High School GPA, Freshman GPA, and TOEFL Scores (N = 128)

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
High School Grade Point Average	3.18	0.20	2.86	3.81
Freshman Grade Point Average	3.17	0.23	2.83	3.73
TOEFL Score	81.07	2.62	77.00	88.00

Descriptive Statistics: Student Family, Friends, and Living Arrangements

A few questions were asked of students with regard to family and friend social support and their current living arrangements. Descriptive statistics regarding these variables are presented in Table 3. Students reported frequently communicating with their family: almost half of the students ($n=59$, 46.1%) spoke with their family two times per week, over a

third ($n=40$, 31.3%) spoke with their family one to three times per month, and almost a quarter of students ($n=29$, 22.6%) spoke with their family three times a week.

With regard to intercultural socialization, students reported having a limited number of close American friends. Over a third of participants reported having no close American friends ($n=45$, 35.2%) while an additional third of students reported having just one close American friend ($n=44$, 34.4%). Less than a quarter of students ($n=26$, 20.3%) reported having two close American friends, and even fewer students ($n=13$, 10.2%) reported having three close American friends. The low number of close American friends may have been due to almost a half of the students ($n=60$, 46.9%) living with other Chinese students or friends (see Table 3 for additional information on students' living arrangements).

Table 3

Frequencies and Percentages: Current Social Support from Family and Friends and Living Arrangement (N = 128)

Variable	N	%
Number of Times Communicate with Family		
1-3 times per month	40	31.3
2 times per week	59	46.1
3 times per week	29	22.6
Number of Close American Friends		
None	45	35.2
One	44	34.4
Two	26	20.3
Three	13	10.2
Current Living Arrangement^a		
Other Chinese	60	46.9
Americans	26	20.3
Chinese and Americans	27	21.2
American and Foreigners, not Chinese	14	10.9
Live Alone [*]	1	0.7

Note. The variables of *number of times the student communicated with family* and *number of close American friends* reported by students were treated as interval variables in statistical analyses. ^a The variable *current living arrangement* was dummy-coded: one variable was computed, with one category, *living with other Chinese individuals* compared to one other category, coded as *not living with other Chinese individuals*. ^{*} The one person who reported living alone was not include in statistical analyses.

Descriptive Statistics: Number of Foreign Languages and Chinese Dialects Spoken and Number of Foreign Countries Visited

Finally, students were asked answer questions as to whether they spoke other foreign languages in addition to English, if they spoke other Chinese dialects in addition to standard Mandarin Chinese, and the number of times they visited the United States and other countries. Table 4 provides descriptive statistics of students' responses. A majority of students ($n=155$, 89.8%) reported English as their only foreign language. The same number of students ($n=155$, 89.8%) – although not the same students - reported speaking Mandarin and one additional dialect. An additional 38 (29.7% of) students reported speaking Mandarin and two additional dialects. With regard to foreign travel, the United States was the only foreign country visited by the majority of students ($n=103$, 80.5%). In addition, over two-thirds of students ($n=87$, 68.0%) stated that they had not visited the United States prior to coming to the United States to attend Cambridge College.

Table 4

Frequencies and Percentages: Languages and Dialects Spoken and Visits to Foreign Countries (N = 128)

<i>Variable</i>	<i>N</i>	<i>%</i>
Number of Foreign Languages Spoken^a		
English only	115	89.8
English and one additional foreign language	13	10.2
Number of Chinese Dialects Spoken^b		
Mandarin only	5	3.9
Mandarin and one additional dialect	82	64.1
Mandarin and two additional dialects	38	29.7
Mandarin and three additional dialects	3	2.3
Number of Foreign Countries Visited^c		
United States only	103	80.5
United States and one additional country	6	4.7
United States and two additional countries	7	5.5
United States and three additional countries	12	9.4
Number of Times Visited United States^d		
No other times	87	68.0
One other time	14	10.9
Two other times	19	14.8
Three other times	6	4.7
Four other times	2	1.6

Note. ^a Due to the large number of students who only spoke English, the variable *number of foreign languages spoken* was not included in analyses. ^b The variable *number of Chinese dialects spoken* was dummy-coded: one variable was computed comparing the category of *speak Mandarin only/Mandarin and one additional dialect* to one other category, *speak Mandarin and at least two other dialects*. ^c Due to the large number of students having visited only the United States, the variable *number of foreign countries visited* was not included in analyses. ^d The variable of *number of times visited United States* was dummy-coded: a variable was computed comparing the category of *never visited United States prior to attending college* to one other category, *visited the United States at least one other time prior to attending college*.

Descriptive Statistics: Study Variables

This study utilized the 32-item Acculturative Stress Scale for Chinese College Students (ASSCS; Bai, 2016), the only validated assessment that specifically measures aspects of acculturative stress for Chinese college students. Scoring of ASSCS items entails using a Likert-type coding scale from 1=never to 7=all the time (Bai, 2016). Results from a series of exploratory factor analyses conducted by Bai (2016) determined that the ASSCS

was comprised of five factors (subscales): language insufficiency (10 items), social isolation (8 items), perceived discrimination (7 items), academic pressure (4 items), and guilt toward family (3 items).

Table 5 presents the descriptive statistics for the five ASSCS subscales and total scale. The mean of the ASSCS language insufficiency subscale was 40.67 ($Md = 37.00$, $SD = 13.70$). The range of the ASSCS language subscale scores was somewhat truncated, from 16.00-61.00 points, with no students providing very low nor very high scores (the potential range of scores for this subscale is 10.00 to 70.00 points). The ASSCS social isolation subscale had a mean of 23.95 ($Md = 21.00$, $SD = 10.31$). The range of the scores on the ASSCS social isolation subscale was 9.00 to 41.00 points; comparisons to the potential range of scores (i.e., 7.00 to 56.00 points) indicated that levels of social isolation among students in this study were relatively low.

Students experienced low levels of discrimination. The highest score on the ASSCS perceived discrimination subscale was 21.00 points, out of a potential 49.00 points; further, the mean score was 14.05 points ($Md = 15.00$, $SD = 4.07$). The mean score of 17.76 ($Md = 20.00$, $SD = 6.17$) for the ASSCS academic pressure subscale indicated that students had average levels of academic stress. This was confirmed by the range of scores from 8.00 to 27.00 points, which was relatively aligned with the potential range of scores of 4.00 to 28.00 points. The ASSCS family guilt mean score of 6.48 ($Md = 6.00$, $SD = 1.91$) as well as the highest score being 11.00 out of a potential 21.00 points indicated that students experienced low degrees of family guilt. The total ASSCS mean score was 102.92 ($Md = 96.00$, $SD = 33.55$), and the range of scores of 43.00 to 149.00 points. In comparison to the potential range of scores between 32.00 and 224.00 points for the total ASSCS, students in this study experienced moderately low levels of acculturative stress.

Table 5

Descriptive Statistics: Acculturative Stress Scale for Chinese College Students (ASSCS) Subscales and Total Scale (N = 128)

	<i>M</i>	<i>Md</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Z_{sk}</i>	<i>α</i>
ASSCS Language Insufficiency	40.67	37.00	13.70	16.00	61.00	-0.50	.98
ASSCS Social Isolation	23.95	21.00	10.31	9.00	41.00	1.29	.96
ASSCS Perceived Discrimination	14.05	15.00	4.07	7.00	21.00	-1.71	.91
ASSCS Academic Pressure	17.76	20.00	6.17	8.00	27.00	-1.24	.97
ASSCS Family Guilt	6.48	6.00	1.91	3.00	11.00	0.33	.77
ASSCS Total	102.92	96.00	33.55	43.00	149.00	-0.38	.98

Note. The potential range of scores for the 10-item ASSCS language insufficiency subscale is 10.00-70.00 points. The potential range of scores for the 8-item ASSCS social isolation subscale is 8.00-56.00 points. The potential range of scores for the 7-item ASSCS perceived discrimination subscale is 7.00-49.00 points. The potential range of scores for the 4-item ASSCS academic pressure subscale is 4.00-28.00 points. The potential range of scores for the 3-item ASSCS family guilt subscale is 3.00-21.00 points. The potential range of scores for the ASSCS total is 32.00-224.00 points.

The East Asian Acculturation Measure (EAAM; Barry, 2001) was utilized in this study to measure the four theoretical acculturation strategies of assimilation, separation, marginalization, and integration. Acculturation strategies were the categorical variables of interest for the first research question, which inquired as to which of the four acculturation strategies were most commonly adopted by study participants. The first research question is addressed later in this chapter; in this section of the chapter, descriptive statistics of the interval-coded EAAM subscales are presented for information purposes only.

Table 6 provides the descriptive information on the four interval-coded acculturation strategy scales, all of which could range from 1.00 to 7.00 points (Barry, 2001). The EAAM scales with the lowest mean scores were marginalization ($M = 2.02$, $Md = 2.00$, $SD = 0.59$) and assimilation ($M = 2.15$, $Md = 1.71$, $SD = 1.15$). The low mean scores coupled with the truncated range of scores (i.e., 1.00-3.11 for marginalization and 1.00-4.29 for assimilation) suggested that very few, if any, participants identified with these two acculturation strategies. The EAAM integration strategy had a mean of 3.58 ($Md = 3.80$, $SD = 1.21$), and integration scores ranged from 2.00 to 5.80 points. These values suggested that the acculturation strategy of integration was adopted by some study participants. The same can be said for the

acculturation strategy of separation, which had the highest mean ($M = 4.65$, $Md = 4.43$, $SD = 1.19$) as well as the highest range of scores, from 2.57 to 6.29 points.

Table 6

Descriptive Statistics: East Asian Acculturation Strategies (EAAM) Subscales (N = 128)

	<i>M</i>	<i>Md</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Z_{sk}</i>	<i>α</i>
EAAM Assimilation	2.15	1.71	1.15	1.00	4.29	1.19	.92
EAAM Separation	4.65	4.43	1.19	2.57	6.29	1.10	.94
EAAM Marginalization	2.02	2.00	0.59	1.00	3.11	0.05	.87
EAAM Integration	3.58	3.80	1.21	2.00	5.80	0.29	.89

Note. As all EAAM subscales are computed as mean scores, the potential range of scores for the subscales is 1.00-7.00 (Barry, 2001).

Testing of Assumptions

Specific tests, in accordance with recommendations from scholars (e.g., Ghasemi & Zahediasl, 2012; López et al., 2015; Nimon, 2012; Osborn, 2012, 2013; Tavakol & Dennick, 2011) determined if five assumptions to the data, discussed in detail in chapter 3, were met. These are discussed in the following sections.

Assumption 1: Variables are Measured Without Error

Cronbach's alphas, computed for study variables, determine if the assumption that variables are measured without error (Tavakol & Dennick, 2011). Cronbach's alphas were computed for the ASSCS subscales and total scale and are reported in Table 5. As seen in Table 5, the Cronbach's alphas for the acculturative stress subscales ranged from .77, good, for the ASSCS family guilt subscale to .98, excellent, for the ASSCS language insufficiency subscale. The total ASSCS had a Cronbach's alpha of .98, which indicated excellent inter-item reliability. Cronbach's alphas were also computed for the four EAAM acculturation strategies and are reported in Table 6. Cronbach's alphas ranged from .87 for the marginalization strategy to .94 for the separation strategy. Based on the good to excellent Cronbach's alphas for the ASSCS subscales and total scale and the EAAM acculturation scales, the assumption that variables were measured without error was met.

Assumption 2: Normality in the Distribution of Scale Scores

The assumption of normality for ASSCS subscales and total scale was tested by computing z_{skewness} scores (i.e., skewness divided by skewness standard error; Ghasemi & Zahediasl, 2012) and comparing these scores to the critical z_{skewness} value of ± 1.96 . The z_{skewness} values were computed for the ASSCS subscales and total scale and are reported in Table 5. z_{skewness} values ranged from -1.71 for the ASSCS perceived discrimination subscale to 0.33 for the ASSCS family guilt subscale. The increased z_{skewness} of the perceived discrimination subscale in comparison to the other ASSCS subscales (and total scale) was likely due to a positive skew of the data, with students reporting lower levels of perceived discrimination. The z_{skewness} value of the total ASSCS was very acceptable at -0.38.

Table 6 presents the z_{skewness} values for the EAAM acculturation strategy scales. The marginalization strategy scale displayed an almost perfect normal curve, as indicated by a z_{skewness} value of 0.05. The assimilation strategy scale had the highest z_{skewness} value of 1.19, well below the critical value. The separation and integration strategy scales had z_{skewness} values of 1.10 and 0.29, respectively. As all ASSCS subscales and total scale had z_{skewness} values that were lower than ± 1.96 , the assumption of normality was met for the data.

Assumption 3: Lack of Multicollinearity

A lack of multicollinearity assumes that independent variables and when relevant, dependent variables, measure distinct and conceptually different constructs that are not significantly associated with one another or are significantly associated with one another to a small to moderate degree (Grömping, 2015; Nimon, 2012). Bivariate correlations, such as Pearson's or Spearman's rho correlations, in association with variance inflation factors (VIFs) determine if the assumption of lack of multicollinearity is met. The general rule-of-thumb for lack of multicollinearity is if a bivariate correlation is $r < .80$, $p < .001$ and VIFs

are less than 10.00 (Darlington & Hayes, 2016; Nimon, 2012) The assumption of lack of multicollinearity is met if VIFs are less than 10.00.

Assumption of lack of multicollinearity: Independent variables

Table 7 presents the Pearson bivariate correlations and VIFs for the ASSCS subscales and total scales acculturative stress subscale and total scale. As seen in Table 7, the ASSCS subscales were significantly correlated with one another at $p < .001$, although the family guilt subscale did display much lower correlation coefficients (ranging from $r[128] = .20, p < .001$ to $r[128] = .48, p < .001$) The total ASSCS was significantly associated with the ASSCS language insufficiency, social isolation, perceived discrimination, and academic pressure subscales at $r(128) > .80, p < .001$, indicating multicollinearity. The total ASSCS was significantly correlated with the family guilt subscale, albeit to a lower degree, $r(128) = .46, p < .001$. The VIFs between the ASSCS subscales ranged from 3.54 (between perceived discrimination and family guilt) to 13.43 (between language insufficiency and family guilt), with most of the VIFs at the level of multicollinearity. Moreover, all of the VIFs were greater than 10.00 between the total ASSCS and the ASSCS subscales. These findings indicated that the assumption of lack of multicollinearity was not met for the variable of total ASSCS and the ASSCS subscales. Based on the violation of this assumption, the total ASSCS was used in HMLR analyses to address the third research question.

Table 7

Pearson Bivariate Correlations and Variance Inflation Factors (VIFs): Acculturative Stress Subscales and Total Scale (N = 128)

	<i>Language Insufficiency</i>	<i>Social Isolation</i>	<i>Perceived Discrimination</i>	<i>Academic Pressure</i>	<i>Family Guilt</i>	<i>Acculturative Stress</i>
Language Insufficiency	--	8.77	12.38	6.82	13.43	13.76
Social Isolation	.92***	--	6.70	10.48	10.24	10.53
Perceived Discrimination	.73***	.83***	--	11.33	3.57	12.56
Academic Pressure	.94***	.89***	.75***	--	9.44	10.66
Family Guilt	.42***	.39***	.20***	.48***	--	16.81
Acculturative Stress	.98***	.97***	.83***	.96***	.46***	--

Note. Pearson bivariate correlations are below the diagonal and VIFs are above the diagonal. *** $p < .001$

Assumption of lack of multicollinearity: Dependent variables

A Pearson bivariate correlation and a VIF was calculated for the dependent variables of TOEFL test score and first-year GPA. The correlation between the two dependent variables was $r(128) = .89, p < .001$, and the VIF was 10.62. The assumption of lack of multicollinearity was violated for the dependent variables. The dependent variable of first-year GPA was selected as the dependent variable for the second research question, as it measured academic achievement among Chinese students who had spent at least one year at Cambridge College.

Assumption 4: Little to no Autocorrelation between Regression Residuals

An assumption specific to hierarchical multiple linear regression (HMLR), multiple linear regression (MLR), and linear regression (LR) is little to no autocorrelation between regression residuals, that is, the regression residuals (errors) are independent from one another (Nimon, 2012; Osborne, 2013). The Durbin-Watson statistic assesses the relationships between residual, and little to no autocorrelation is evident if the Durbin-Watson value is between 1.00 and 3.00 (Nimon, 2012; Osborne, 2013). The Durbin-Watson value for the HMLR conducted for the first component of the third research question (how do select descriptive variables relate to first-year GPA?) was 2.01, and the Durbin-Watson value for the HMLR conducted for the second component of the third research question (how do select descriptive variables relate to acculturative stress?) was 1.98. The assumption of little to no autocorrelation between regression residuals was met for both HMLR analyses.

Assumption 5: Homoscedasticity

Another assumption specific to HMLR, MLR, and LR is that data show homoscedasticity, that is, the variance of residuals (errors) is the same across all levels of the independent variables (Nimon, 2012; Osborne, 2013). Homoscedasticity is tested by computing a scatterplot of the standardized predicted dependent variable by the standardized

residuals of the predictors; if the data points fall equally above and below the zero line, the assumption of homoscedasticity is met (Nimon, 2012; Osborne, 2013). As seen in the two scatterplots computed for the third research questions in Figures 1 and 2, the data points fell equally above and below the zero line. The assumption of homoscedasticity was met for both HMLRs.

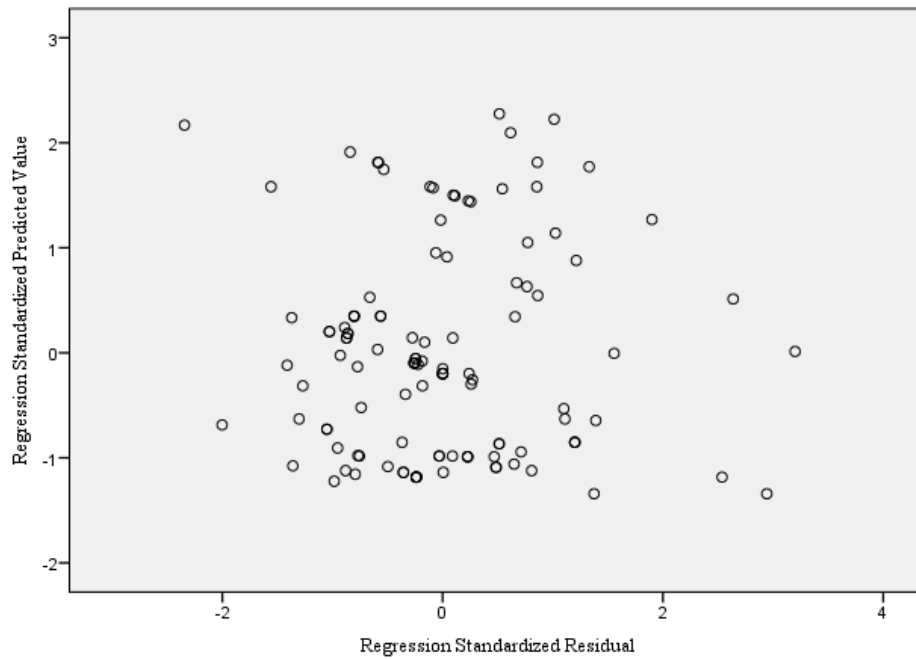


Figure 8. Scatterplot to test Homoscedasticity-Research Question 3 (descriptive variables and GPA)

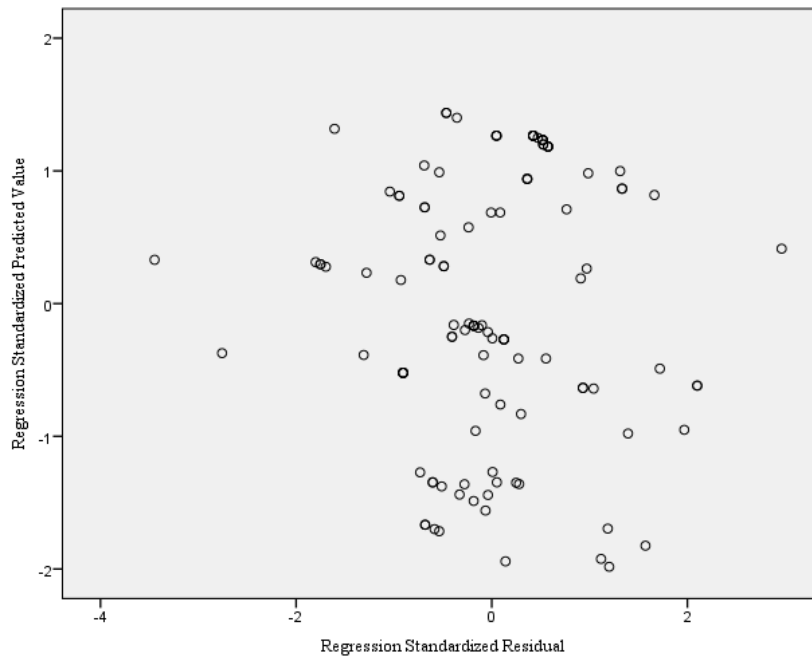


Figure 9. Scatterplot to test Homoscedasticity-Research Question 3 (descriptive variables and acculturative stress)

Testing of Covariates

It should be noted that the variables of number of foreign languages spoken and number of countries visited were not included in analyses. Almost 90% ($n = 115$) of participants spoke only one foreign language; English, and over 80% ($n = 103$) students reported having only visited the United States. There were too few students in the other categories respectively to be able to make statistically rigorous and meaningful comparisons.

To determine if any descriptive variables were significantly associated with the dependent variables of first-year GPA and acculturative stress, a series of Spearman's rho correlations were conducted. Spearman's rho correlations, which are the nonparametric equivalents to Pearson bivariate correlations (Darlington & Hayes, 2016), were conducted as many of the descriptive variables were categorically coded. The results with regard to the dependent variable of first-year GPA are presented first and are followed by results regarding the dependent variable of acculturative stress.

Covariate Testing: Descriptive Variables and Acculturative Stress

With regard to the first component of research question three (how do select descriptive variables relate to acculturative stress?), the majority of these descriptive variables were independent variables. Thus, the testing of covariates entailed associating, through Spearman's rho correlations, the descriptive variables of age, gender, high school GPA, living arrangements with the total ASSCS. As seen in Table 8, two of the four variables were significantly associated with acculturative stress. A low high school GPA was significantly associated with increased acculturative stress, $r(128) = -.79, p < .001$. Moreover, having a living arrangement where the student lived only with other Chinese individuals was significantly associated with increased acculturative stress, $r(128) = .78, p < .001$. To confirm this association, an independent samples *t*-test was conducted and was found to be significant, $t(126) = 14.14, p < .001$. Notably, students who lived exclusively with other Chinese individuals had a significantly higher acculturative stress mean score of 130.78 ($SD = 20.96$), over 50 points higher than students who had other living arrangements, whose acculturative stress mean score was 78.34 ($SD = 20.92$). The two significant variables of high school GPA and acculturative stress were entered as covariates on the first model (step) of the HMLR employed to address the first component of the third research question of the study.

Table 8

Spearman Rho Correlations: Descriptive Variables and Acculturative Stress (N = 128)

Variables	ASSCS Acculturative Stress
Age	.01
Gender	-.09
High School GPA	-.79***
Living Arrangement: Live with Chinese or Not	.78***

Note. *** $p < .001$

Covariate Analyses: Descriptive Variables and First-year GPA

The second component of research question three (how do select descriptive variables relate to first-year GPA/academic performance?) was addressed through Spearman's rho correlations which were conducted for the testing of covariates. The results from these analyses are presented in Table 8. A large number of descriptive variables were significantly correlated with first-year GPA. High school GPA was significantly correlated with first-year college GPA, $r(128) = .73, p < .001$, as was speaking Mandarin and at least one additional Chinese dialect, $r(128) = .67, p < .001$. Moreover, having visited the United States prior to coming to the United States to study at Cambridge College was also significantly associated with first-year GPA, $r(128) = .59, p < .001$.

There were significant associations between fathers' having a high school degree or a zhuanke degree in comparison to having a master's degree or higher and first-year GPA, $r(128) = -.49, p < .001$ and $r(128) = -.37, p < .001$, respectively. Similarly, mothers' having a high school degree in comparison to having a bachelor's degree or higher was significantly associated with first-year GPA, $r(128) = -.47, p < .001$. Higher levels of paternal and maternal education levels were significantly associated with higher first-year college GPAs. Family income level was significantly associated with first-year GPA, $r(128) = .69, p < .001$: as income level increased, so did students' first-year GPA³. Increased frequency of communication with family was significantly associated with higher first-year GPAs, $r(128) = .21, p = .018$; in addition, the number of close American friends was significantly associated with higher freshman GPAs, $r(128) = .75, p < .001$. In contrast, living only with other Chinese peers in comparison to having other living arrangements led to significantly lower freshman GPAs, $r(128) = -.66, p < .001$. All variables significantly associated with

³ The family income level variable was also recoded into two dummy coded variables, comparing low income to above average/high income and average income to above average/high income. Both dummy coded variables were significantly associated with freshman GPA, $r(128) = -.69, p < .001$ and $r(128) = -.31, p < .001$, respectively.

freshman GPA were included as covariates in the first model (step) of the HMLR conducted for the third research question.

Table 9

Spearman Rho Correlations: Descriptive Variables and Freshman GPA (N = 128)

<i>Variables</i>	<i>Freshman GPA</i>
Age	-.07
Gender	.10
High School GPA	.73***
Number of Chinese Dialects Spoken	.67***
Number of Times Visited United States	.59***
Father's Education: High School versus Master's or Higher	-.49***
Father's Education: Zhuanke versus Master's or Higher	-.37***
Father Education: Bachelor's versus Master's or Higher	-.06
Mother's Education: High School versus Bachelor's or Higher	-.46***
Mother's Education: Zhuanke versus Bachelor's or Higher	-.09
Family Income Level	.69***
Frequency of Communication with Family	.21*
Number of Close American Friends	.75***
Living Arrangement: Live with other Chinese or Not	-.66**

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Research Question 1

The first research question was, 'What is the most common acculturation strategy adopted by first-year Chinese international students at an American college?' To address this question, a series of computations were conducted on the East Asian Acculturation Measure (EAAM) in accordance with recommendations by Barry (2001). The four EAAM acculturation strategy subscales - the 8-item assimilation subscale, the 7-item separation subscale, the 5-item integration subscale, and the 9-item marginalization subscale - were computed by summing the respective subscale items and dividing this summed value by the number of items in the respective subscale. This resulted in a mean scale score for each acculturation strategy.

The scales were then recoded as dichotomous variables, with 0 = score less than 3.50 and 1 = score greater than or equal to 3.50 in accordance with Barry (2001). As the analyses

were conducted separately for each acculturation strategy, participants could be placed into more than one strategy category. Table 10 provides the frequency and percentage of students across the four acculturative strategy categories.

Table 10

Frequencies and Percentages: EAAM Acculturative Strategies (Dichotomous) (N = 128)

<i>Variable</i>	<i>N</i>	<i>%</i>
Assimilation		
Low (score < 3.50)	103	80.5
High (score >= 3.50)	25	19.5
Separation		
Low (score < 3.50)	23	18.0
High (score >= 3.50)	105	82.0
Marginalization		
Low (score < 3.50)	128	100.0
High (score >= 3.50)	0	0.0
Integration		
Low (score < 3.50)	54	42.2
High (score >= 3.50)	74	57.8

To identify which acculturation strategy was adopted by students based on their highest score across the four strategy categories, a new acculturation strategy variable was computed. When categorized based on their highest score, students fell into two categories: separated and integrated (see Table 11). The majority of students ($n = 91, 71.1\%$) adopted the acculturation strategy of separation while almost a third of students ($n = 37, 28.0\%$) adopted the acculturation strategy of integration.

Table 11

Frequencies and Percentages: Acculturative Strategies (Categorical) (N = 128)

<i>Acculturative Strategy Category</i>	<i>N</i>	<i>%</i>
Separated	91	71.1
Integrated	37	28.0

To determine if significant differences in first-year GPA and acculturative stress differed by the two acculturative strategies of separation and integration - thus requiring the entry of acculturative strategy as a covariate for the second and third research questions - two independent samples *t*-tests were conducted. Results from both independent samples *t*-tests were significant. Students who adopted an integrated strategy had a significantly higher first-year college GPA mean score ($M = 3.42, SD = .20$) than did students who adopted a separation strategy ($M = 3.07, SD = .15$), $t(126) = 10.63, p < .001$. In contrast, students who adopted the acculturation strategy of integration had a significantly lower acculturative stress mean score ($M = 12.62, SD = 3.17$) than did students who adopted the acculturation strategy of separation ($M = 21.98, SD = 4.33$) - a difference of over 7 points - $t(126) = -11.90, p < .001$.

Research Question 2

The second research question investigated by this study was: “How does acculturative stress relate to academic performance in first-year Chinese international students?” To calculate acculturation-related stress levels in the sample population, stress was categorized using quartiles of the range of the data from Bai’s ASSCS (Bai, 2012, 2105). The data were grouped for analysis as: Low-Stress, Moderate-Stress, Above-Average-Stress, and High-Stress.

Within the context of this study, the data reveal a relatively even spread across general acculturative stress levels across the sample, with 28.13% ($n=36$) reporting low levels of

acculturative stress, 23.44% (n=30) reporting moderate levels of acculturative stress, 23.44% (n=30) reporting above average levels of acculturative stress, and 25% (n=32) reporting high levels of acculturative stress. This relatively even numeric spread provided a relatively balanced sample from which to explore acculturative stress and its relationship to academic performance.

Acculturative Stress and GPA

One-way analysis of variance revealed a significant effect of stress on performance, $F(3, 124) = 91.73, p < .001$, Tukey HSD post hoc comparisons can be seen in tables 12 and 13 with significant differences found between all of the groups.

Table 12

ANOVA results for RQ2

Source	SS	df	MS	<i>F</i>	<i>p</i>
Corrected Model	4.487 ^a	3	1.5	91.73	0.001
Intercept	1273.28	1	1273.28	78089.72	0.001
Stress	4.49	3	1.496	91.73	0.001
Error	2.02	124	0.02		
Total	1294.42	128			
Corrected Total	1	127			

a. Adjusted R Squared = .682

Table 13

Multiple Comparisons by stress group; Low, Moderate, Above Average, and High

Dependent Variable: GPA

Tukey HSD

(I) WTStress_cat	(J) WTStress_cat	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
Low	Moderate	.23828*	.031566	.000	.15607
	Above Ave	.35794*	.031566	.000	.27574
	High	.49403*	.031024	.000	.41324
Moderate	Low	-.23828*	.031566	.000	-.32048
	Above Ave	.11967*	.032970	.002	.03381
	High	.25575*	.032451	.000	.17124
Above Ave	Low	-.35794*	.031566	.000	-.44015
	Moderate	-.11967*	.032970	.002	-.20553
	High	.13608*	.032451	.000	.05157
High	Low	-.49403*	.031024	.000	-.57482
	Moderate	-.25575*	.032451	.000	-.34026
	Above Ave	-.13608*	.032451	.000	-.22059

When compared with the Moderate-Stress group, the Low-Stress group maintained a GPA which was .238 points higher on a standard 4.0 scale. Similarly, the mean difference in GPA between Low-Stress and Above-Average-Stress groups was .358. When compared to the High-Stress group, the Low-Stress group's mean GPA was .494 points higher. These data confirm a statistically significant inverse association between acculturative stress level and student academic performance as measured by GPA in this cohort of first-year Chinese international students.

Research Question 3

The third research question, "To what extent do the number of foreign languages spoken, international travel experience, parents' level of education, household income, frequency of family communication, number of American friends and phase (time spent in the U.S) correspond with acculturative stress and GPA in first-year international students at

and American college?” consists of two dependent variables: acculturative stress and GPA. In order to evaluate these two variables, separate HMLRs were run. The first model was run with the dependent variable: GPA. Because of the eight missing data points for father’s highest level of education (which overlapped with six of the seven missing data points for mother’s highest level of education), the one participant who provided his/her father’s highest level of education but did not provide the highest education level of his/her mother, and the one participant who reported living alone, the sample size for the HMLR was $n = 118$. Covariates were entered on the first model (step) of the HMLR, followed by the total ASSCS on the second model (step) of the HMLR.

Results from the HMLR are presented in Table 14. The first model of the HMLR was significant, $F(11, 106) = 63.77, p < .001$. Based on the R^2 of 0.87, the five significant covariates explained 87% of the variance in the dependent variable of first-year GPA, a very large effect size. The first model of the HMLR revealed five significant results. As high school GPA increased, so did first-year college GPA, $\beta(128) = .41, p < .001$. Similarly, speaking Mandarin and at least two other dialects was significantly predictive of first-year GPA, $\beta(128) = .25, p < .001$. Both fathers’ and mothers’ highest level of education significantly predicted first-year GPA: having a father with a zhuanke degree in comparison to a master’s degree or higher and having a mother with a high school degree in comparison to bachelor’s degree or higher significantly predicted a *lower* first-year GPA, $\beta(128) = -.16, p = .001$ and $\beta(128) = -.20, p = .001$, respectively. Moreover, living exclusively with Chinese peers was significantly predictive of a *lower* first-year GPA, $\beta(128) = -.24, p < .001^4$.

The second model of the HMLR was also significant, $F(1, 105) = 10.40, p = .002$. Based on the R^2 of 0.01, acculturative stress explained 1% of the variance in the dependent

⁴ This finding was confirmed by conducting an independent samples *t*-test. Students who lived with Chinese peers only had a significantly lower freshman GPA mean score of 3.02 ($SD = 0.13$) as compared to students who had different living arrangements, whose freshman GPA mean score was 3.31 ($SD = 0.21$), $t(126) = -9.60, p < .001$.

variable of first-year GPA, a small effect size. Results showed that decreased acculturative stress was significantly associated with a higher first-year GPA, $\beta(128) = -.36, p = .002$. That is, as acculturative stress decreased, first-year GPA increased. All covariates, with the exception of living exclusively with Chinese peers, remained significant predictors of first-year college GPA. Based on the significant association between acculturative stress and first-year GPA, the null hypothesis was rejected for the second research question.

Table 14

Hierarchical Multiple Linear Regression (HMLR): Acculturative Stress Predicting Freshman GPA, Controlling for Covariates (N = 118)

	Model 1			Model 2		
	B	SE B	B	B	SE B	B
High School GPA	.45	.06	.41***	.35	.07	.32***
# Chinese Dialects	.12	.03	.25***	.11	.03	.23***
# Times Visited US	.06	.03	.12	.05	.03	.10
Father: HS/Master's+	-.01	.02	-.03	-.03	.02	-.08
Father: Zhuanke/ Master's+	-.07	.02	-.16***	-.07	.02	-.16***
Mother: HS/Bachelor's+	-.05	.02	-.20**	-.06	.02	-.24***
Family Income	.03	.02	.10	-.01	.03	-.04
Family Communication	.02	.01	.07	.02	.01	.07
# American Friends	.03	.02	.11	.02	.02	.09
Living Arrangement	-.11	.03	-.24***	-.04	.03	-.10
Acculturation Strategy	-.01	.02	-.05	-.03	.04	-.06
Acculturative Stress				-.00	.00	-.36**
Model F	63.77		10.40			
R ²	0.86		0.01			
Sig (p)	<.001		.002			

An additional HMLR addressed the second component of the third research question, “To what extent do the number of Chinese dialects spoken, international travel experience, parent’s level of education, household income, frequency of family communication, and number of American friends correspond with *acculturative stress* in first-year Chinese international students at an American college?” Because of the eight missing data points for father’s highest level of education (which overlapped with six of the seven missing data points for mother’s highest level of education), the one participant who provided his/her father’s highest level of education but did not provide the highest education level of his/her

mother, and the one participant who reported living alone, the sample size for the HMLR was $n = 118$. The variables of high school GPA, living arrangement, and acculturation strategy were included as covariates, and they were entered on the first model (step) of the HMLR.

The variables of: number of Chinese dialects spoken, having visited the United States prior to attending Cambridge College, father's highest level of education being a high school degree as compared to a master's degree or higher, father's highest level of education being a zhuanke degree as compared to a master's degree or higher, mother's highest level of education being a high school degree as compared to a bachelor's degree or higher, household income, frequency of family communication, and number of American friends were entered as independent variables on the second model (step) of the HMLR. The dependent variable was acculturative stress.

Results from the HMLR are presented in Table 15. The first model of the HMLR was significant, $F(3,114) = 198.60, p < .001$. Based on the R^2 of 0.84, the three covariates of high school GPA, living arrangement, and acculturation strategy – all of which were significant at $p < .001$ - explained 84% of the variance in the dependent variable of acculturative stress, a large effect size. As high school GPA increased, acculturative stress decreased, $\beta(128) = -.40, p < .001$. Living exclusively with Chinese peers led to increased levels of acculturative stress, $\beta(128) = .42, p < .001$, as did adopting an acculturation strategy of separation, $\beta(128) = -.25, p < .001$.

The second HMLR model was also significant, $F(8,106) = 9.77, p < .001, R^2 = .07$. Three independent variables, all related to education and income, significantly predicted acculturative stress. Fathers having a high school degree in comparison to a master's degree or higher significantly predicted increased acculturative stress, $\beta(128) = -.14, p = .015$. Moreover, mothers having a high school degree in comparison to a bachelor's degree or higher significantly predicted increased acculturative stress, $\beta(128) = -.12, p = .047$. Finally,

family income significantly predicted acculturative stress: as family income increased, acculturative stress decreased, $\beta(128) = -.39, p < .001$. The covariates of high school GPA and living exclusively with Chinese peers remained significant predictors of acculturative stress in the second model of the HMLR, $\beta(128) = -.26, p < .001$ and $\beta(128) = .41, p < .001$, respectively. As determined by the strength of the standardized beta weights, the covariate of living exclusively with Chinese peers was the most significant predictor of acculturative stress, followed by the independent variable of family income. An additional Pearson bivariate correlation was run for the relationship between acculturative stress and the number of American friends that a student reported having. When this relationship was examined in isolation – without any other predictors as was done in the HMLR for research question three, it was found to be highly significant, $r = -.75, p < .001$: As the number of close American friends decreased, acculturative stress increased.

Based on some significant associations between the independent variables and acculturative stress, the null hypothesis was partially rejected for the third research question.

Table 15

Hierarchical Multiple Linear Regression (HMLR): Number of Chinese Dialects Spoken, Number of Times Visited the United States prior to Attending Cambridge College, Father's Highest Level of Education, Mother's Highest Level of Education, Household Income, Family Communication, and Number of American Friends Predicting Acculturative Stress, Controlling for Covariates (N = 118)

	<i>Model 1</i>			<i>Model 2</i>		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	<i>B</i>
High School GPA	-65.22	8.50	-.40***	-41.93	7.88	-.26***
Living Arrangement	28.28	3.18	.42***	27.08	3.33	.41***
Acculturation Strategy	-18.17	3.76	-.25***	-0.39	4.43	-.01
# Chinese Dialects				2.38	3.22	.03
# Times Visited US				-2.76	3.59	-.04
Father: HS/Master's+				-7.04	2.84	-.14*
Father: Zuanke/ Master's+				0.48	2.46	.01
Mother: HS/Bachelor's+				-4.07	2.03	-.11*
Family Income				-18.04	2.76	-.39***
Family Communication				-0.51	1.44	-.01
# American Friends				-1.54	2.24	-.05
Model <i>F</i>	198.60		9.77			
<i>R</i> ²	0.84		0.07			
Sig (<i>p</i>)	<.001		<.001			

Summary

Acculturation and acculturative stress among college and university students have been topics of theoretical and empirical interest since the 1990s, but the majority of studies have focused on Mexican and other Hispanic students as well as students who were first generation college students (Arbona & Jimenez, 2014; Kuo, 2014; Schwartz et al., 2013). The acculturation literature that has addressed concerns of Chinese international undergraduate students (e.g., Bai, 2016; Cao, Zhu, & Meng, 2016; Forbush & Foucault-Welles, 2016) is relatively nascent, and as a result, more limited. The principal objectives of this research were threefold: (a) to determine the predominant acculturative strategies that Chinese international undergraduate students adopt during their first year at an American college; (b) to establish the relationship between acculturative stress and academic achievement among first-year Chinese international students; and (c) to examine which demographic, foreign travel experience, living arrangement, and family and friend social

support factors, if any, were significantly associated with acculturative stress and academic performance among these students. In order to uncover these relationships, this research employed a range of statistical methods, including Spearman's rho correlation analysis, *t*-tests, and hierarchical multiple linear regression (HMLR). The results of these analyses revealed several significant relationships that may be broadly classified in one of three major areas: Acculturative Strategy findings; Acculturative Stress-related findings, and GPA-related findings.

With regard to acculturative strategy, the data indicate that a majority ($n = 91$, 71.1%) of students adopted a separation strategy, and that this was significantly associated with higher acculturative stress and lower first-year GPA in this study cohort.

Almost a third of the sample ($n = 37$, 28%) reported adopting an integration strategy, which was confirmed to correlate with lower levels of acculturative stress and higher GPA respectively. No students within the study cohort reported adopting an assimilation or marginalization strategy.

Analysis of the association between acculturative stress and academic performance confirmed a significant inverse relationship between the two variables: as acculturative stress increased, GPA decreased and vice versa.

Additional demographic variables were explored to determine their relationship to acculturative stress. Seven of these were found to have a statistically significant associations: (1) lower high school GPA was highly predictive of higher acculturative stress, (2) living exclusively with other Chinese is correlated with high levels of acculturative stress, (3) adopting an integration strategy is associated with the lowest levels of acculturative stress, (4) lower acculturative stress is significantly associated with higher first-year GPA, (5) parental education level is inversely correlated with acculturative stress, (6) family income is inversely correlated with acculturative stress, and (7) levels of acculturative stress are

significantly inversely correlated with the number of American friends a student reports having.

In the course of analysis, demographic characteristics were also evaluated with regard to their relationship to academic performance, as captured by first-year GPA. The data revealed nine significant correlations with academic performance, as follows: (1) high school GPA is positively correlated with first year college GPA, (2) speaking two or more Chinese dialects in addition to standard Mandarin is positively correlated with GPA, (3) prior visits to U.S. are significantly correlated with GPA, (4) higher paternal and maternal education levels positively correlate with first year GPA, (5) family income level positively correlates with GPA, (6) the number of close American friends reported significantly correlates with GPA, (7) living exclusively with Chinese has a significant inverse relationship with GPA, (8) students adopting an integration strategy achieve significantly higher first-year GPA's, and (9) family income level is positively correlated with GPA.

Chapter 5: Discussion of Research Findings

The purpose of this research was threefold. The first purpose was to gain an understanding as to the acculturation strategies adopted by first-year Chinese international students at an American college. The second purpose was to examine the relationship between acculturative stress and academic performance in this student cohort. The third purpose was to determine which, if any, demographic, family and friend support, living arrangement, and foreign travel and language variables were significantly associated with acculturative stress.

This chapter is organized in four subsections. The first examines the major research findings of this study. Interpretations and explanations of these findings, as guided by the theoretical model and previous research, are presented and evaluated. The second subsection details the theoretical, research, practical implications, and potential applications of the findings. Section three discusses the limitations of the study, and the extrapolative constraints posed by the nature of the participants and the institution in which the research was conducted. The fourth subsection presents recommendations for further research. This chapter concludes with a summary overview of the work, its place within the research literature, and the relevance of ongoing investigation into this particular area of cross-cultural educational research.

Results and Discussion of Research Questions

Acculturation Strategy

The first of three research questions investigated by this study was: “What is the most common acculturation strategy adopted by first-year Chinese international students at an American university?”

Berry's theoretical model of acculturation includes a quadrant model of acculturation strategy which categorizes four distinct approaches to the acculturative process: assimilation, integration, separation, and marginalization (Berry, 1997). According to Berry (1997), the acculturation strategy a migrant adopts is dependent on the interplay between an individual's desire to retain the characteristics, behaviors, attitudes, language, and beliefs of the culture of origin, and their desire to engage with or adopt those characteristics of the new host culture.

Previous cross-cultural research has suggested that Chinese international students tend to exhibit patterns of in-group socialization and limited intercultural interaction (Kim, Omizo, & Michael, 2005; Lin & Betz, 2009; Liu, 2002; Lowinger et al., 2014; Stevens, 2012). The current research confirmed these findings in first-year Chinese undergraduates attending an American college.. Indeed, the majority of the sample population ($n = 91$, 71.1%) reported adopting a separation strategy, which is characterized by a strong adherence to the language, practices and beliefs of the culture of origin, and a rejection of or separation from the dominant host culture (Berry, 1997). Nearly a third of the sample ($n = 37$, 28%) reported integration, which is characterized by both cultural maintenance (culture of origin) and engagement within the broader host population, as their adopted acculturation strategy.

These findings align with the majority of observations in previous research, but differ with findings reported by Kline and Liu (Kline & Liu, 2005). Kline and Lui's research into the acculturation strategies of Chinese international undergraduates and graduates found students evenly split between separation and integration acculturation strategies. While results of this study supported a portion of Kline and Lui's findings; that separation and integration were the only two strategies adopted by Chinese international students, it found that the majority of students in the sample adopted a separation strategy rather than an even distribution between separation and integration. As stated previously, a substantial majority of students in this study – over 70% - had adopted the separation strategy. The difference in

findings between Kline and Liu's research and the results of the current study may be due in some part to the inherent differences in the samples. Kline and Liu's sample included a broad range of Chinese international students (both graduate and undergraduate), representing an older sample than that of the current research. Specifically, 52% of participants were over 25 years of age in Kline and Liu's study while the mean age of students in this study was 18.30 years, with students' ages ranging from 17 to 20 years. Moreover, 30% of the participants in Kline and Liu's study were married. While marital status data were not gathered in this study it was unlikely that a substantial percentage of participants were married, based on the relatively young age of the study participants. Perhaps most importantly, participants in Kline and Liu's study had spent more time in America (e.g., two to five years), while participants in this study had spent one year (plus any previous visits, which were relatively rare) in America. It is highly possible that a participants' adopted acculturation strategy might change over time based on the number of years spent within the host culture (Geary, 2016).

Considering the differences between the two samples, it may be reasoned that some combination of previous higher education experience, age, phase, and perhaps marital status may in some way influence the acculturation strategy students employ. What is clear in the context of this research is that first-year Chinese international students who are approximately 18 years of age, have lived in the U.S. for less than one year, report little international travel experience, speak no foreign languages excepting English, and have fewer than two close American friends largely adopt a separation acculturation strategy. This is followed by a minority of such students who follow an integration acculturation strategy during their first year at an American college.

Acculturative Stress and Academic Performance

The second research question of this study investigated the relationship between acculturative stress and academic performance. In order to tease apart the somewhat overlapping relationships between the variables of acculturative strategy, acculturative stress and academic performance, a series of discrete analyses were performed, and the findings discussed here.

Acculturation Theory prescribes an analysis of the linguistic, historical and cultural aspects of the culture of origin and the culture of settlement in order to assess the cultural distance and the resultant acculturative stressors experienced by intercultural migrants (Berry, 1997). It predicts that such acculturative stresses, amplified by the degree of cultural distance between the culture of origin and the culture of settlement, may impact the migrants' psychological wellbeing, social interaction, and cognitive functioning (Berry, 1997; Glass & Westmont, 2012; Li, Chen & Duanmu, 2010; Sullivan & Kashubeck-West, 2015; Stone, Feinstein & Ward). This prediction has been supported by research confirming that acculturative stress can negatively impact academic performance and cognitive function in a variety of intercultural migrant groups (Berry, 1980, 1990, 1994, 1995; Glass & Westmont, 2012; Li, Chen & Duanmu, 2010; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015; Stone, Feinstein & Ward, 1990; Ward & Rana-Deuba, 1999). In light of this previous guiding research, the current study predicted a significant inverse correlation between acculturative stress and academic performance in a previously un-researched sample; first-year Chinese international undergraduates.

The results of Bai's Acculturative Stress Survey for Chinese Students (ASSCS) revealed a moderate level of acculturative stress in the sample population overall, yet further analysis indicated significant differences in acculturative stress levels between students adopting an integration strategy and those who adopted a separation strategy, as measured by Barry's

EAAM (Barry, 2001). Two independent sample *t*-tests were conducted to assess differences in acculturative stress levels between the two acculturation strategies. The results of this analysis revealed that the minority of students ($n = 37, 28\%$) who adopted an integration acculturation strategy reported significantly lower levels of acculturative stress than those adopting a separation strategy. This finding is consistent with assertions by Berry, Kim, Minde, and Mok that of the four acculturative strategies, integration is predicted to be associated with the lowest levels of acculturative stress in a migrating population (Berry & Kim, 1987; Berry et al, 1988). Additional analysis confirmed a significant inverse relationship between acculturative stress and first-year GPA; with increased levels of acculturative stress being correlated with lower GPA and vice versa.

This association suggests that either academic pressures contribute to acculturative stress as Bai (2016) asserted, or that stresses associated with the acculturative process result in compromised cognition, as suggested by Berry and others (Berry, Kim, Minde, & Mok, 1987). Bai's inclusion of academic pressure as a subscale within the ASSCS assumes that academic challenges are directly related to the acculturative process, however, it may be reasonably argued that these elements might exist as separate and possibly unrelated phenomena. While it is clear that academic pressure is a significant source of stress for many undergraduate students (domestic and international alike), it is somewhat less clear whether academic pressure is exclusively related to the acculturative process within Chinese international students. For these reasons, it may be worth reconsidering whether academic pressure should be included as a subscale within an assessment tool designed to measure acculturative stress in Chinese students.

Additional analysis of acculturative strategy and academic achievement (as captured by first-year GPA) revealed that students who adopted an integration strategy also attained significantly higher grade point averages ($M = 3.42, SD = .20$) than those adopting a

separation strategy ($M = 3.07$, $SD = .15$). HMLR analysis found a minimal (.01 effect size) but significant ($\beta(128) = -.36$, $p = .002$) correlation between acculturative stress level and GPA as well, showing that as acculturative stress decreased, first-year GPA increased. These results point to a close and statistically significant association between acculturation strategy, acculturative stress and academic performance in first-year Chinese international students, yet direct causal relationships remain somewhat unclear.

Regardless of whether there exist direct cause and effect relationships between the variables of acculturation strategy, acculturative stress, and academic achievement, it can be confidently asserted that within the sampled population: integration strategy is significantly associated with both higher first-year GPA and lower reported levels of acculturative stress than is the separation strategy in first-year Chinese international students. Similarly, lower acculturative stress levels are significantly associated with higher GPA's in this student cohort.

Demographic Variables' Relationships to Acculturative Stress and GPA

Acculturation theory outlines multiple moderating factors which are predicted to influence the acculturation process and associated acculturative stress (Berry, 1997). Following this model, the third research question addressed by this study was: How do the proximal variables of: number of foreign languages spoken, number of Chinese dialects spoken, international travel experience, educational level of parents, household income, frequency of family communication, number of American friends, and phase (time spent in the US) relate to acculturative stress in first-year Chinese international students at an American college?

Foreign Language and Dialect Fluency

Based on previous research by Martirosyan, Hwang, and Wanhoji, showing that the number of foreign languages spoken by an international student is predictive of positive

academic performance (Martirosyan, Hwang, & Wanjohi, 2015), and because academic pressure is a fundamental variable in Bai's acculturative stress scale, this research hypothesized that both the number of foreign languages and Chinese dialects (which may be considered analogous to additional languages) spoken by the individuals in the sample would be negatively correlated with acculturative stress. This assumption was further bolstered by additional work by Cleveland and colleagues which suggests that fluency in multiple languages likely predisposes intercultural migrants to increased cultural flexibility during cross-cultural transitions (Cleveland et al, 2011).

Because of the very low number of individuals within the sample reporting fluency in languages other than Chinese and English, statistically meaningful analysis was not possible, and therefore no conclusions in this regard are reported. Students reporting multiple dialects were, however, more numerous; with 64.1% of the sample speaking one additional dialect, 29.7% speaking two additional dialects, and 2.3% speaking three additional dialects.

While a Spearman's rho correlation did not reveal any significant association between acculturative stress and multiple dialect fluency, there was a significant correlation between multiple dialect fluency and GPA. The sample data showed a strongly significant positive correlation between these variables in students who reported fluency in two or more dialects in addition to standard Mandarin Chinese; with those students attaining significantly higher first-year GPA's. This interesting finding supports the assumption that fluency in multiple Chinese dialects may be roughly analogous to multiple language fluency as it relates to higher academic achievement. It may also be reasoned that while multiple dialect fluency is correlated with positive academic achievement, the fact that each dialect remains within the context of an overall Chinese culture, cultural flexibility (a proposed moderating factor of acculturative stress) is not directly related or indicated. This may explain that while multiple

dialect fluency is significantly correlated with GPA, it has no apparent moderating effect on acculturative stress.

Parental Education Level

Among the acculturation-moderating variables recognized in Berry's model, education level/previous exposure to education is considered a key factor (Berry, 1997). It was therefore hypothesized that the education level of parents is to some degree reflected in the outlook, attitudes and experiences of their children, and may have some relationship to acculturative stress. The data in this study showed a significant association between acculturative stress and both the fathers' and mothers' education levels. HMLR analysis indicated that having a father with a high school education (as compared to a master's degree or higher) was highly predictive of higher levels of acculturative stress in first-year Chinese students,. Similarly, the data show that students whose mothers had attained a high school degree only (in comparison to a bachelor's degree or higher) were significantly more likely to experience increased levels of acculturative stress,. These associations held when comparing parental education with students' first-year academic performance (as captured by GPA).

Both fathers' and mothers' education level were found to be highly predictive of first-year academic achievement in first-year Chinese international students. HMLR analysis revealed that having a father whose highest degree level is a zhuanke (when compared to having a master's degree or higher) is strongly predictive of lower first-year GPA ($\beta(128) = -.16, p = .001$), as is having a mother whose highest degree attainment is a high school degree (as compared to a bachelor's or higher) ($\beta(128) = -.20, p = .001$).

These findings suggest that parental education level is closely associated with both acculturative stress levels and academic achievement; with a significant inverse relationship between parental education level and acculturative stress, and a significant positive relationship between parental education level and first-year GPA.

Family Income Level

Research into the relationships between household income and student academic performance in undergraduate and in medical students shows a strong positive correlation between a family's financial status and student academic performance (Fadem, Schuchman, & Simring, 1995; Hahs-Vaughn, 2004). This positive relationship was confirmed within the population of this study ($p < .001$), with students from wealthier families achieving significantly higher GPA's than those from the lowest income levels. While attributing causation is beyond the scope of this work, it may be reasonably assumed that students from above average and higher income levels in both the United States and within China have more direct access to additional supports, specialized academic training, and other advantages that are not shared by students of lower income groups.

Academic stress is a subscale of Bai's acculturative stress scale, and because academic performance is clearly correlated with household income, it was hypothesized that household income would also correlate with lower stress levels in Chinese international students. The data revealed a strong inverse association between household income and acculturative stress, $\beta(128) = -.39, p < .001$; with the highest household income students reporting the lowest stress levels, and those from lower household incomes reporting the highest levels of stress. As mentioned earlier in this work, financial stresses are often significant sources of anxiety and worry for international undergraduate students who are typically self/family-funded, receive little scholarship support, and are not authorized to work in the United States while enrolled in a degree program. It is therefore likely that family income level has a direct influence the manifestation of stress during the acculturation process, with students from wealthier families experiencing significantly less stress than those from families that are less well off.

Frequency of Family Communication

Previous research by Kline and Liu (2005) showed an inverse relationship between the regularity of family communication and acculturative stress in Chinese international students. While hypothesized in this study, a significant correlation between frequency of family communication and acculturative stress was not confirmed within this research. Although Chinese family connectedness and obligation exist as fundamental cornerstones of Confucian ideology, the frequency of communication with family did not appear to correlate with an increase or decrease in acculturative stress within this population. Additional Spearman's rho analysis did, however, reveal a significant relationship between family communication and GPA; with increasing family communication corresponding with higher first-year academic performance. The reasons behind this association remain unclear, yet may be related to the influence of regular family encouragement of academic focus and hard work.

Number of American Friends and Living Arrangements

Based on previous research on intercultural socialization and acculturative stress moderation, this research predicted an inverse correlation between the number of American friends a student reported, and the corresponding levels of acculturative stress expressed. As predicted, the data showed a significant ($r = -.75, p < .001$) inverse relationship between acculturative stress and the reported number of close American friends, with students reporting two or more American friends experiencing significantly lower levels of acculturative stress. Notably, no students with two or more American friends reported high levels of acculturative stress. Conversely, students with one or zero close American friends reported the highest levels of acculturative stress within the sample.

The number of close American friends was likewise significantly correlated with GPA $r(128) = .75, p < .001$; with those students reporting more close American friendships attaining the highest GPA's of the group.

These findings confirm the wealth of acculturative research which underscores the importance of intercultural socialization as a major factor in moderating the severity of acculturative stress experienced by international students.

An indirect measure of the regularity of intercultural interaction was further investigated through an analysis of the relationship between roommate choice and acculturative stress level. Cambridge College is an urban, non-residential institution at which students are responsible for securing their own housing. Students therefore have a great deal of autonomy in selecting roommates and individual living situations.

Of all the proximal variables associated with acculturative stress levels, choice of roommates/housemates emerged as the strongest predictor of acculturative stress within the study. An independent samples *t*-test revealed that students who chose to live exclusively with other Chinese reported significantly higher levels of acculturative stress than those living with Americans or individuals of other nationalities, $t(126) = 14.14, p < .001$. At a mean score of 130.78 ($SD = 20.96$), these students reported acculturative stress levels *over 50 points higher* than those with other living arrangements. Further analysis revealed that students living exclusively with other Chinese also achieved significantly lower GPA's than those with other living arrangements.

The reasons behind these significant associations are unclear, but may be rooted in students self-selecting living arrangements that correspond with their comfort level with the language and cultural customs of the host country. It is reasonable to suggest that students with weaker language skills, limited intercultural flexibility, and high cultural adherence might prefer to live with others of a similar profile. As discussed earlier, these characteristics also rank as significant predictors of academic challenges; and may reciprocally contribute to acculturative stress through a negative feedback loop. If this is the case, Chinese students

living exclusively with other Chinese may very well be the worst possible living arrangement both in terms of acculturative stress management and academic performance.

Influence of Phase and High School GPA

Phase (time spent within the host culture) is considered by Berry to be an essential moderating factor within the acculturative process (Berry, 1997). While the participants in this study differed little in terms of their program-related arrival times and length of stay in the U.S., an attempt at approximating differences in phase was made by inquiring about previous visits to the U.S. While overall phase may not be significantly increased by previous visits, it was hypothesized that episodic cultural and linguistic exposure would be associated with reduced levels of acculturative stress. Interestingly, though the data showed no significant association between acculturative stress levels and previous visits to the U.S., a Spearman's rho correlation identified a significant positive correlation between previous U.S. visits and GPA. While the root of this association is unclear, it is possible that students who have previously traveled internationally come from families of higher financial resources than those who have not (data available, but analysis not done). As seen earlier in this discussion, there is a strong correlation between family income level and academic performance, with the highest family incomes being significantly predictive of higher first-year GPA's within the cohort.

The final variable within the dataset that emerged as a significant predictor of both acculturative stress and academic performance was high school GPA. While not originally proposed as a variable within the study, in the course of academic inquiry, previous academic achievement became a point of interest and was thus included in the analysis. A Spearman's rho analysis revealed a significant positive correlation between high school GPA and first-year college GPA. This in itself was neither surprising nor particularly interesting, however, additional analysis also indicated a strong correlation between high school GPA and

acculturative stress. The data indicate that a low high school GPA is significantly associated with increased levels of acculturative stress within this student cohort, $r(128) = -.79, p < .001$. This finding is significant because it acts as an additional pre-matriculation predictor of acculturative stress, and may be a helpful marker for identifying students who might benefit from proactive student support during early transition.

Implications of Findings

Theoretical Implications

The results of this study support the fundamental assumptions of Acculturation Theory; that intercultural migrants will adopt an acculturation strategy that reflects the interplay between their desire to maintain the cultural practices and attitudes of their culture of origin, and their interest in adopting those of the new host culture (Berry, 1997). It further confirms Acculturation Theory's predictions that stresses related to the acculturative process, amplified by the degree of cultural distance between the culture of origin and the culture of settlement, can impact cognitive (in this case academic) performance.

The strong preference for a separation acculturation strategy within the research sample underscores the degree of cultural distance between China and the United States, and speaks to the inherent value Chinese undergraduate students place in maintaining their linguistic and cultural practices and identities during their first year in America.

In general, this research strongly supports the assumptions and predicted outcomes of Acculturation Theory when applied to intercultural migrants within an academic setting. It provides a clear confirmation of the connections between cultural distance, acculturative stress, and various demographic variables in the acculturation process.

Research Implications

The current research supports a number of previous findings and contrasts with others. Specifically, studies of the associations between acculturative stress and academic

performance are further confirmed, while previous studies indicating the relative impact of some stress-moderating variables such as frequency of family communication are not supported. Those predicted demographic variables which were not supported as having significant relationships to acculturative stress levels include international travel experience, previous visits to the U.S. (predicted as a function of phase), or frequency of family communication. Additional research may be required to clarify the potential moderating effects of these variables, and may lead to the identification of additional, yet unknown and unexplored moderating variables.

Overall this study indicates that using a highly focused sample which is surveyed within a narrow window during the acculturation process can provide helpful insight into early-acculturation dynamics in Chinese international students.

Practical Implications

Chinese nationals represent the largest international student subgroup at American institutions of higher education today. With approximately 300,000 Chinese nationals now enrolled at American colleges and universities, student retention, academic achievement, persistence-to-graduation, and general socioemotional support for these students have become areas of significant interest to American institutions of higher education (Bartlett & Fischer, 2011; Hanover Research, 2010; Ma, 2014; Stevens, 2012).

The objectives of this study; to clearly identify first-year Chinese international students' acculturation strategy, their general levels of acculturative stress, the relative influence of demographic and behavioral variables, and the potential impact of acculturative stress on academic performance is highly pragmatic. In order for institutions to develop more responsive and informed bridge programming, student support and remediation systems for these students, this well-defined understanding of the various acculturation dynamics becomes both informative and instructive.

Among the most obvious conclusions indicated by these findings is the importance of intercultural engagement early on in the acculturative process. Not only is the significance of close friendships within the host population underscored, but the importance of intercultural engagement through housing and other socially-oriented constructs becomes clear.

Recommendations to the study-site institution include developing an American host-family program designed to encourage intercultural exchange and support; instituting additional language lab supports and speaking practice opportunities; creating institutional clubs and activities specifically aimed at intercultural engagement, and trainings for faculty and staff regarding the particular suite of challenges that first-year Chinese student may be facing.

Research Limitations

The current research was constructed upon a theoretical model that has been consistently applied to study intercultural migrants in a variety of settings (Berry, 1980, 1990, 1994, 1995; Glass & Westmont, 2012; Li, Chen, & Duanmu, 2010; Sue & Zane, 1985; Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999).

Over decades of cross-cultural research, numerous validated survey instruments have been developed to assess the acculturative process and levels of associated acculturative stress in a wide range of migrant groups (Sullivan & Kashubeck-West, 2015; Ward & Rana-Deuba, 1999). Two such validated and reliable instruments were selected for data collection in the current study; Jeiru Bai's Acculturative Stress Scale for Chinese Students (ASSCS; Bai, 2012, 2015), and Declan Barry's East Asian Acculturation Measure (EAAM; Barry, 2001). While the instruments have shown to be valid research tools, there are specific limitations which need to be openly disclosed.

While many of the questions in Bai's survey instrument were adapted from pre-existing scales, there are some fundamental assumptions built into the survey design that may lead to false-positive interpretations. For example, Bai contends that statement 1 of the ASSCS: "I

hesitate to participate in classroom discussion and [sic] seminar” is representative of English language insufficiency (Bai, 2012, 2015). It is however important to note that while real-time classroom participation *may* be related to English language fluency, it may also reflect a pre-existing social orientation entirely unrelated to language proficiency. Indeed, numerous statements within the tool itself are phrased in such a way that there can be no direct differentiation between the students’ American experience and their previous experiences in their home country. Therefore, items like statement 21 (used to quantify social isolation): “ I have [sic] limited social life” need to be further clarified in relation to previous experience, i.e. “I have a more limited social life in the U.S. than I did in China”. While there also appear some quizzically regular grammatical errors within the English version of Bai’s survey tool, independent translations of the Chinese version of the survey have been acceptable.

Recognizing these shortcomings, it is recommended that future use of Bai’s survey instrument include modifications to reflect and clarify current experience/orientations versus previous experience/orientations. Furthermore, the English version of Bai’s tool should be corrected for grammatical errors.

Barry’s EAAM is far less vulnerable to false-positive assumptions, as it is designed to capture real-time attitudes and experiences related to self-identity (Barry, 2001). The survey instrument reflects contextual attitudes, purposefully queried in the present tense in order to approximate a participant’s current acculturation strategy. One potential limitation of the instrument may be its delivery format, which is English. To guard against possible language fluency bias, the instrument was translated into Chinese for this research.

The potential for generalizing the findings of this study may be further limited due to the purposefully narrow sample under investigation. While Chinese international students in general may experience many of the same acculturative dynamics, stressors and stress moderators as the sample, the narrow age range, phase-range, and prior educational

experience range of the sample may make broad generalizations problematic. Indeed, the explicit intention of this study was to explore acculturation dynamics within a discrete window of intercultural transition, in a highly defined sample of first-year Chinese international students. Acculturation is a process, not a singular event. Caution is therefore urged in extrapolating these findings to other student groups, at other periods within the acculturation process.

The nature of the institution at which the students enrolled is another potential limiting factor to broad generalization. While Cambridge College maintains TOEFL requirements in line with moderately selective institutions, it is nevertheless an open-enrollment college, requiring a high school diploma or equivalent as the only other prerequisite. SAT, ACT or other admissions examination scores are not required of applicants, nor is there a minimum GPA requirement for entry. While the average high school GPA of the participants was 3.178 ($SD = 0.99$) and was within the acceptance range of moderately selective schools, it must be noted that Cambridge College does not base admissions on high school GPA or the results of standardized college aptitude/admissions examinations.

Furthermore, Cambridge College is an urban, non-residential campus which provides no direct housing services for its enrollees. This means that students are required to identify and secure their housing in neighboring areas. This free-choice of roommates, while providing an interesting dynamic which was investigated by this research, may not be representative of the housing situation at more traditional colleges, and is likely more akin to graduate-level student housing experiences.

The final consideration of limitation is the difficulty posed by determining cause and effect in correlational analysis. The nature of correlational analysis, while effective in determining the relationships between variables, does not confirm causality (Creswell, 2009). It is entirely possible, for example, that acculturative stress does not in fact directly influence

academic performance. It may be, rather, that strong academic performance manifests itself in reduced feelings of social and linguistic stress in these students. Because correlational analysis confirms only that: correlations, it is prudent to remain cautious of attributing cause and effect relationships between the variables investigated.

Areas of Further Research

This study helps to shed light upon a narrow window of acculturative process in a highly-defined student sample. It is intentionally restricted in scope, and therefore inherently limited in its assertions. Such views of acculturative process provide a highly-focused snapshot of the experience in real-time, yet are largely unable to describe the process over multiple years.

In order to develop a more nuanced view of the acculturative process through time, longitudinal studies must be explored. While Kenneth Wang and colleagues conducted one longitudinal stress study in Chinese international students in 2006 (Wang et al., 2006), the mixed sample of undergraduates and (primarily) graduate students in that study may limit its application to the undergraduate student experience. It is therefore recommended that more long-term, longitudinal analysis be conducted on Chinese undergraduates in order to track potential change over time.

Another limitation of the current study, which may be alleviated by further research, was the lack of pre-acculturative data. Because pre-existing attitudes and behaviors may be influential within the acculturative process, the development of pre-acculturation data may prove instructive. Adding to this, it is considered prudent to clarify language within the sampling tools to differentiate between past and current social, academic and behavioral patterns.

A portion of this research was dedicated to the identification of variables which are significantly correlated with acculturative stress. While the current study has effectively shown that certain variables proximal to the acculturative process are associated with overall

levels of acculturative stress, it did not ascertain the relative strengths of those associations. In other words, while we now know which of the variables under investigation are correlated with higher or lower stress levels, we remain unsure of the individual effects of each variable on the broader picture. Additional research and statistical analysis will be needed to evaluate the relative strengths of these variables in moderating acculturative stress.

In the course of further exploring potential stress-related factors, it became clear that the current research's list of variables was neither comprehensive nor exhaustive. The list of potential variables may be reasonably expanded to include religious practices and beliefs, physical activity levels, general health status, study habits, relationship status, employment status, perceived individual popularity, and any number of potentially related stress moderators. It is therefore considered essential that the research community fully explore the suite of potential stress-related variables to gain a more accurate view of the dynamics related to acculturative process in these students. While it may never be fully possible to uncover any and all potential factors related to the acculturation experience, the more data that is developed, the clearer the picture will ultimately become.

Finally, the development of additional acculturative stress tools is recommended. While Bai's instrument retains several strengths, the tool is restricted to sampling only four subscales of acculturative stress: language deficiency, social isolation, perceived discrimination, academic pressure, and guilt toward family. It is not clear whether some portions of the scale may reflect pre-existing attitude and orientations or whether they are directly attributable to the acculturative process.

Conclusion

Chinese international students represent a significant and expanding source of diversity, cultural exchange and enrollment within American institutions of higher education (Bertlett & Fischer, 2011; I.I.E. Open Doors Report, 2015; Stevens, 2012; Sullivan &

Kashubeck-West, 2015; Yakunina et al., 2012; Zhang & Goodson, 2011). The United States is currently host to nearly 300,000 Chinese international students, of which a nearly half are first-time undergraduates (I.I.E. Open Doors Report, 2015). With the growing population of this distinct international student cohort, institutions of higher education have an increasing responsibility to understand the specific suite of acculturative challenges these students face.

Studies exploring the sociocultural behaviors and attitudes of Chinese international students have identified a number of academic and social obstacles related to language, cultural differences, learning styles and attitudes, intercultural socialization, classroom engagement, and academic integrity (Bartlet & Fischer, 2011; Chan, 1999; He, Lopez, & Leigh, 2012; Jin & Liu 2014; Li, 2003; Liu, 2002; Lowinger et al., 2014; Lueck & Wilson, 2010; Ma, 2014; Martin, 1994; Rawwas et al., 2004; Song-Turner, 2008; Stevens, 2012; Wicks, 1996). This research suggests that many of the difficulties these students face are rooted in disparate cultural and linguistic foundations, collectively known as *cultural distance*.

A review of the social, historical and linguistic differences between the United States and China confirms a relatively high degree of cultural distance between the two countries. Acculturation Theory predicts that the degree of cultural distance between a culture of origin and a culture of settlement contributes to increased levels of acculturative stress in a migrating population, and this stress has been shown to impact migrants' psychological wellbeing, social interaction, and cognitive functioning (Berry, 1997; Glass & Westmont, 2012; Li, Chen & Duanmu, 2010; Sullivan & Kashubeck-West, 2015; Stone, Feinstein, & Ward).

The purpose of this study was to explore acculturation strategy, acculturative stress, and academic performance in first-year Chinese international students at an American college. The research sampled 128 first-year Chinese international undergraduate students

during their spring term at Cambridge College; a private, non-residential, urban, open-enrollment institution.

This study had three primary objectives. The first; to identify the most common acculturation strategy adopted by the student sample, was accomplished by analyzing data from Barry's East Asians Acculturation Measure (EAAM, Barry, 2001). The resulting analysis confirmed that 71.09% of respondents favored a separation acculturation strategy, characterized by a strong adherence to the language, practices and beliefs of the culture of origin, while largely rejecting those of the dominant host culture (Berry, 1997). A smaller percentage (28.91%) adopted an integration acculturation strategy, which is embraced by intercultural migrants who find adaptive value in both cultural maintenance, and engagement within the broader host population (Berry, 1997).

The second objective of this study was to explore the association between acculturative stress and academic performance. Using Bai's ASSCS instrument, individual levels of acculturative stress were obtained and analyzed in relation to GPA as a measure of academic performance. The data confirmed a strong inverse correlation between the variables; with students in the low-stress category achieving the highest GPA's, and students in the high-stress category achieving the lowest GPA's of the sample. This finding supports previous work in other migrant populations which confirm a negative correlation between stress and cognitive function.

The final component of this research was engaged in identifying proximal demographic variables within the sample population which were associated with high and low levels of acculturative stress. The analysis of the data reveal that the following proximal variables are significantly associated with lower levels of acculturative stress within the sample population: multiple foreign language fluency; mothers with a bachelor's degree or higher; above average or higher family income level; two or more close American friends,

and exclusively American roommates. The data further show that higher levels of acculturative stress are significantly associated with: fathers with a high school or lower education; below average family income; one or zero close American friends, and exclusively Chinese roommates.

This research was conducted with the intention of clarifying acculturation strategy and acculturative stress dynamics in a narrowly-defined sample within a restricted temporal window within the acculturation process. It is hoped that the information learned here will inspire further investigation into this interesting and increasingly relevant area of research. It is further hoped that by gaining a deeper understanding of the various acculturative challenges these students face, institutions will be better positioned to develop informed and supportive practices which encourage both intercultural engagement and academic success.

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APPENDIX A - Consent to Participate in a Research Study

Cambridge College • Cambridge, MA

Title of Study: _____

Investigators:

Name: _____ **Dept:** _____ **Phone:** _____

Name: _____ **Dept:** _____ **Phone:** _____

Name: _____ **Dept:** _____ **Phone:** _____

Introduction

- You are being asked to be in a research study of acculturative stress (the stress associated with moving into and living within a new culture) in first-year Chinese international college students.
- You were selected as a possible participant because of your status as a first-year Chinese international college student at Cambridge College.
- We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study

- The purpose of the study is understand how the stress associated with moving to a new country, culture and language impacts students' feelings of wellbeing and their coursework.
- Ultimately, this research may be published in an academic journal or other publication in order to help institutions to better support their Chinese international students.

Description of the Study Procedures

- If you agree to be in this study, you will be asked to participate in a survey which will ask you about your family and educational background, and your personal feelings of stress related to moving to and studying in America. Additionally, you will be giving the researcher permission to look at your course grades during your first year of study.

Risks/Discomforts of Being in this Study

- This study presents no expected risks to you. However, the survey will ask you for some details about you and your family, including education level, household income, number of languages spoken, travel history, levels of stress, and other personal information. While this information is kept strictly confidential and your identity will not be shared with any others, it is possible that you may feel discomfort providing this information.
- **Benefits of Being in the Study**
- There are no direct benefits to you for participating in this study. The information you provide, however, may help institutions of higher education develop more supportive programming for future generations of Chinese international students.

Confidentiality

- The records of this study will be kept strictly confidential. Research records will be kept in a locked file, and all electronic information will be coded and secured using a password

protected file. We will not include any information in any report we may publish that would make it possible to identify you.

Payments

- You will receive a \$10 Dunkin' Donuts gift card in thanks for your time and participation in the study.

Right to Refuse or Withdraw

- The decision to participate in this study is entirely up to you. You may refuse to take part in the study *at any time* without affecting your relationship with the investigators of this study or Cambridge College. Your decision will not result in any loss or benefits to which you are otherwise entitled. You have the right not to answer any single question, as well as to withdraw completely from the study at any point during the process.

Right to Ask Questions and Report Concerns

- You have the right to ask questions about this research study and to have those questions answered by me before, during or after the research. If you have any further questions about the study, at any time feel free to contact me, James Lee at james.lee@cambridgecollege.edu or by telephone at 617.230.0904. If you like, a summary of the results of the study will be sent to you. If you have any other concerns about your rights as a research participant that have not been answered by the investigators, you may contact Dr. Tracy McLaughlin-Volpe, Chair of the Cambridge College Institutional Review Board at (617) 873-0150.

Consent

- Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Subject's Name (print): _____

Subject's Signature: _____ Date: _____

Investigator's Signature: _____ Date: _____

APPENDIX B - Acculturative Stress Scale for Chinese Students (ASSCS) (Bai, 2012, 2015)

ASSCS-English Edition

Acculturative Stress Scale for Chinese Students
<p>This scale describes some stressful situations that might occur to you after you come to the U.S. Please circle the number that BEST describes your experience, using following scale: 1=never---2---3=sometimes---4---5=often---6---7=all the time.</p>
1. I hesitate to participate in class discussion and seminar.
2. My social circles shrank after I come to the U.S.
3. I feel that I receive unequal treatment.
4. I feel helpless.
5. I feel a lot of academic pressure.
6. I am treated differently because of my race.
7. It is hard for me to follow the lectures and conversations in classes.
8. I cannot express myself very well when using English.
9. I do not have many friends in the U.S.
10. I don't feel a sense of belonging (community) here.
11. People from some other ethnic groups show hatred toward me.
12. I worry about my parents.
13. I feel nervous to communicate in English.
14. I feel that others are biased toward me.
15. I often have to work overtime in order to catch up.
16. I feel bored here.
17. I feel that my people are discriminated against.
18. I feel frustrated that I am not able to participate in class discussions.
19. I feel guilty to leave my family and friends behind.
20. I am not used to the English way of thinking.
21. I have limited social life.
22. I feel angry that my people are considered inferior here.
23. I lack confidence when I have to do presentations in English.
24. The intensive study makes me sick.
25. I feel guilty that I cannot take care of my parents.
26. My vocabulary is so small that I always feel short of words.
27. I feel lonely in the U.S.
28. I feel some people don't associate with me because of my ethnicity.
29. It is a big pressure for me to publish academic paper in English.
30. I shy away from social situations due to my limited English.
31. I do not have new social network here.
32. Academic pressure has lowered the quality of my life.
<p>Instructions:</p> <p>(1) Final score equals the sum of scores on each item.</p> <p>(2) There are five subscales:</p> <p align="center">- Subscale 1 Language Insufficiency: Item 1, 7, 8, 13, 18, 20, 23, 26, 29, 30.</p>

APPENDIX C: ASSCS (Bai, 2012, 2015)

ASSCS-Chinese Edition

在美中国留学生跨文化适应压力量表	
这个量表描述了中国留学生来到美国后可能遇到的产生压力的情景。这些情境发生在您的生活中过吗?1=从未发生---2---3=偶尔---4---5=经常---6---7=一直存在。	
1.	上课或参加研讨会的时候我不敢用英文发言。
2.	来美之后,我的社交圈子越来越小。
3.	我感到我受到了不平等的待遇。
4.	我感到很无助。
5.	我感到学业压力很大。
6.	因为我的种族背景我受到了不同的待遇。
7.	上课的时候我很难听懂老师和同学的对话。
8.	我不能很自如的用英语表达自己的想法。
9.	在美国我的朋友很少。
10.	我在美国没有归属感。
11.	有一些种族的人对我表现出厌恶。
12.	我很担心我的父母。
13.	我用英文沟通时会感到很紧张。
14.	其他人对我有偏见。
15.	我常常需要超时学习。
16.	我觉得美国的生活很无聊。
17.	我觉得我的同胞被歧视。
18.	我因为无法参加课堂讨论而感到挫败。
19.	我为离开我的家人和朋友而感到内疚。
20.	我不习惯英文的思维方式。
21.	我的社会生活很少。
22.	我为我的同胞在这里低人一等而感到愤怒。
23.	当我需要用英语做报告时,我感到不自信。
24.	高强度的学习损害了我的身体健康。
25.	我为不能照顾我的父母感到愧疚。
26.	我的英文词汇量不足,要用的时候总觉得不够用。
27.	我在美国感到非常孤单。
28.	我觉得有一些人因为我的种族背景而不与我交往。
29.	用英文发表学术文章让我感到压力很大。
30.	因为英语不好,我试图逃避社交场合。
31.	在美国我没有新的社会网络。
32.	学业上的压力使我的生活质量下降。

使用指南：

- (1) 将每题得分相加即是最后得分。
- (2) 本 I 表包含 T 5 个子 I 表：
- 子 I 表 1 语言障碍：条目 1, 7, 8, 13, 18, 20, 23, 26, 29, 30.
 - 子 I 表 2 社会隔离：条目 2, 4, 9, 10, 16, 21, 27, 31.
 - 子 I 表 3 种族歧视：条目 3, 6, 11, 14, 17, 22, 28.
 - 子 I 表 4 学业压力：条目 5, 15, 24, 32

APPENDIX D – East Asian Acculturation Measure (EAAM; Barry, 2001)

Acculturation item	M	SD
	2.74	1.78
	3.25	1.98
Table I. Means and Standard Deviations of the East Asian Ethnic Acculturation Measure Items	2.81	1.78
	3.14	1.38
	2.74	1.22
Scale 1: Assimilation	2.83	1.32
1 I write better in English than in my native language (for example, Chinese, Japanese, Korean)	3.09	1.12
5 When I am in my apartment/house, I typically speak English	3.46	1.80
9 If I were asked to write poetry, I would prefer to write it in English		
13 I get along better with Americans than Asians'	2.87	1.58
17 I feel that Americans understand me better than Asians do	5.53	1.74
21 I find it easier to communicate my feelings to Americans than to Asians	4.22	1.47
24 I feel more comfortable socializing with Americans than I do with Asians	4.09	1.51
27 Most of my friends at work/school are	4.44	1.57
American Scale 2: Separation	4.60	1.49
2 Most of the music I listen to is Asian	1.69	1.05
6 My closest friends are Asian		
10 I prefer going to social gatherings where most of the people are Asian	4.63	1.72
14 I feel that Asians treat me as an equal more so than Americans do	4.19	1.79
18 I would prefer to go out on a date with an Asian than with an American	5.55	1.32
22 I feel more relaxed when I am with an Asian than when I am with an American	5.13	1.22
25 Asians should not date non-	4.88	1.34
Asians Scale 3: Integration		
3 I tell jokes both in English and in my native language (for example, Chinese, Japanese, Korean)	2.31	1.34
7 I think as well in English as I do in my native language (for example, Chinese, Japanese, Korean)	2.16	1.32
11 I have both American and Asian friends	3.73	1.84
15 I feel that both Asians and Americans value me	4.07	1.62
19 I feel very comfortable around both Americans and Asians	3.64	1.21
Scale 4: Marginalization	2.38	1.21
4 Generally, I find it difficult to socialize with anybody, Asian or American	3.17	1.48
8 I sometimes feel that neither Americans nor Asians like me	3.26	1.55
12 There are times when I think no one understands me	2.81	1.52
16 I sometimes find it hard to communicate with people		
20 I sometimes find it hard to make friends		
23 Sometimes I feel that Asians and Americans do not accept me		
26 Sometimes I find it hard to trust both Americans and Asians		
28 I find that both Asians and Americans often have difficulty understanding me		
29 I find that I do not feel comfortable when I am with other people		

Note. $n = 150$ East Asian immigrants. $M =$ mean, $SD =$ standard deviation.

'Participants were informed that for the purpose of this study 'Asian' pertained to people from China, Japan, and Korea.

APPENDIX E - Barron's College Competitiveness Index. (Center for Public Education, 2016)

<p><i>Most Competitive (Highest selectivity ranking)</i></p> <p>Typically admitted</p> <p>Students ranked in the top 10% to 20% in high school Admit fewer than 33% of applicants</p> <p>School examples Harvard (Northeast) University of Florida (South) Stanford University (West) University of Notre Dame (Midwest)</p>	<p><i>Competitive</i></p> <p>Typically admitted</p> <p>Students ranked the top 50% to 65% in high school Admit between 75% and 85% of applicants</p> <p>School examples University of Nebraska (Midwest) Temple University (Northeast) University of Alabama (South) Arizona State University (West)</p>
<p><i>Highly Competitive</i></p> <p>Typically admitted</p> <p>Students ranked in the top 20% to 35% in high school Admit between 33% and 50% of applicant</p> <p>School examples Brigham Young University (West) Clemson University (South) Northeastern University (Northeast) Grinnell College (Midwest)</p>	<p><i>Less Competitive</i></p> <p>Typically admitted</p> <p>Students ranked in the top 65% in high school Admit more than 85% of applicants</p> <p>School examples California State-Fresno (West) Indiana State (Midwest) University of South Carolina at Aiken (South) New England College (Northeast)</p>
<p><i>Very Competitive</i></p> <p>Typically admitted</p> <p>Students ranked in the top 35% to 50% in high school Admit between 50% and 75% of applicants</p> <p>School examples Ohio State University (Midwest) University of Rhode Island (Northeast) University of South Carolina (South) University of Arizona (West)</p>	<p><i>NonCompetitive (Lowest selectivity ranking)</i></p> <p>Typically admitted</p> <p>Any student who graduated high school Admit 98% or more applicants</p> <p>School examples University of Arkansas at Little Rock (South) University of Nebraska at Kearny (Midwest) Wilmington College (Northeast) Eastern Oregon University (West)</p>

APPENDIX F - Pre-orientation Email to Prospective Participants

Dear X,

Congratulations on your acceptance to Cambridge College! Your advisors and faculty are eager to meet you, and we look forward to seeing you at the international student orientation on XX/XX/XX.

Cambridge College has a long tradition of serving undergraduate students from China, and we are always interested in learning about how we can improve our support for you. To help us do this, we invite you to participate in a study of how the potential stress of moving from one culture to another impacts first-year undergraduate students from China.

I will give you more details of this exciting study when we meet at orientation. There is no obligation to participate, but your help could be an important factor in improving Cambridge College's support for many future generations of Chinese international students.

Thank you, and see you soon!

Best regards,

James Stephen Lee
Undergraduate Dean, Professor of Biology
Cambridge College

APPENDIX G - Acculturation Study Information Sheet for Interested Subjects

Acculturative Stress Research Study

Acculturative Stress is a term used to describe any stress associated with transitioning from one culture to another. Differences in language, social norms, customs, and other factors can sometimes be difficult for people making these transitions. Our study is interested in looking at how first-year Chinese international students cope with and are impacted by transitioning from China to the U.S. Through this study we hope to develop a better understanding of how to support future generations of Chinese international college students in America.

How you can participate:

Students who are interested in participating in this study will be asked to take a survey in the spring semester of their first year at Cambridge. This survey will ask you questions about your experiences here in the U.S. related to cultural transition, and some background information about you and your family. At the end of the spring term we will see if there are any associations between the acculturative stress and student grades. Your answers on the survey will be completely confidential, and your identity will not be disclosed.

What you get:

The knowledge that you are contributing to the welfare and success of future Chinese international students in the U.S...and a \$10 gift card to Dunkin' Donuts.

If you are interested, please write your name and the best ways to reach you below.

Many thanks!

James S. Lee
Primary Researcher

APPENDIX H: Spring Term Email: Call to Participate (3 separate sessions held)

Dear X,

Thank you for your interest in participating in the acculturation study we discussed in the fall term (information sheet attached). We are hosting an information and survey session next Wednesday, XX/XX/XX from 5-7 PM in room 152 at the 1000 Massachusetts Avenue undergraduate campus. We will have light refreshments, and an opportunity for you to ask any additional questions you might have about the research at this time.

If you participate in the study and complete the survey (75 questions total), you will receive a \$10 Dunkin' Donuts gift card in thanks for your time and participation.

APPENDIX I – Research Survey

This survey is designed to help colleges and universities better support first-year Chinese international students studying in the United States. Your answers and identity will be held in strict confidence. Please be as honest with your answers as possible, filling in the circle which BEST represents your answer/experience. Thank You! Your participation is very important in helping us serve and support future Chinese international students.

1. Name: _____

2. Gender: ①Male ②Female

3. Age: _____ years

4. Major: _____

5. How many foreign languages (including English) do you speak?

- ① (English only)
- ② (English + another foreign language)
- ③ (English + 2 other foreign languages)
- ④ (English + 3 other foreign languages)
- ⑤ (English + 4 or more other foreign languages)

6. How many Chinese dialects do you speak?

- ① (Mandarin only)
- ② (Mandarin + 1 other dialect)
- ③ (Mandarin + 2 other dialects)
- ④ (Mandarin + 3 other dialects)
- ⑤ (Mandarin + 4 or more other dialects)

7. How many foreign countries (including the U.S.) have you visited?

- ① (U.S. only)
- ② (U.S. + 1 other foreign country)
- ③ (U.S. + 2 other foreign countries)
- ④ (U.S. + 3 other foreign countries)
- ⑤ (U.S. + 4 or more other foreign countries)

8. How many times have you been to the U.S. before you came to study here?

- ① 0 times
- ② 1 time
- ③ 2 times
- ④ 3 times
- ⑤ 4 or more times

9. What is the highest education level of your father?

- ① Elementary school
- ② High school
- ③ Zhuanke
- ④ Bachelor's degree
- ⑤ Master's degree
- ⑥ Doctoral degree
- ⑦ I don't know

10. What is the highest education level of your mother?

- ① Elementary school
- ② High school
- ③ Zhuanke
- ④ Bachelor's degree
- ⑤ Master's degree
- ⑥ Doctoral degree
- ⑦ I don't know

11. How would you describe your family's income level?

- ① Very low
- ② Low
- ③ Average
- ④ Above average
- ⑤ Very high

12. How frequently do you communicate with your family back home (including email, WeChat, phone calls)?

- ① 1-3 times per month
- ② 1 time per week
- ③ 2 times per week
- ④ 3 times per week
- ⑤ 4 or more times per week

13. How many American friends do you regularly spend time with, and with whom you share intimate details of your life?

- ① 0
- ② 1
- ③ 2
- ④ 3
- ⑤ 4 or more

14. Who do you currently live with?

- ① Other Chinese only
- ② Americans only
- ③ Other foreigners (non-Chinese) only
- ④ Chinese and Americans
- ⑤ Americans and non-Chinese foreigners
- ⑥ Chinese and non-Chinese foreigners
- ⑦ Live alone

The following scale describes some stressful situations that might occur to you after you came to the U.S. Please circle the number that BEST describes your experience, scale: 1=never---2---3=sometimes---4---5=often---6---7=all the time.

1. I hesitate to participate in class discussion and seminars.

- | | | | |
|-------|-----------|-------|--------------|
| Never | Sometimes | Often | All the time |
| ① | ② | ③ | ④ |
| ⑤ | ⑥ | ⑦ | |

2. My social circles shrank after I came to the U.S.

- | | | | |
|-------|-----------|-------|--------------|
| Never | Sometimes | Often | All the time |
| ① | ② | ③ | ④ |
| ⑤ | ⑥ | ⑦ | |

3. I feel that I receive unequal treatment.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

4. I feel helpless.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

5. I feel a lot of academic pressure.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

6. I am treated differently because of my race.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

7. It is hard for me to follow the lectures and conversations in classes.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

8. I cannot express myself very well when using English.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

9. I do not have many friends in the U.S.

Never	Sometimes	Often	All the time
①	② ③	④ ⑤	⑥ ⑦

10. I don't feel a sense of belonging (community) here.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

11. People from some other ethnic groups show hatred toward me.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

12. I worry about my parents.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

13. I feel nervous to communicate in English.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

14. I feel that others are biased toward me.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

15. I often have to work overtime in order to catch up.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

16. I feel bored here.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

17. I feel that my people are discriminated against.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

18. I feel frustrated that I am not able to participate in class discussions.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

19. I feel guilty to leave my family and friends behind.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

20. I am not used to the American way of thinking.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

21. I have a limited social life.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

22. I feel angry that my people are considered inferior here.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

23. I lack confidence when I have to do presentations in English.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

24. The intensive study makes me sick.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

25. I feel guilty that I cannot take care of my parents.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

26. My vocabulary is so small that I always feel short of words.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

27. I feel lonely in the U.S.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

28. I feel some people don't associate with me because of my ethnicity.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

29. It is a lot of pressure for me to write academic papers in English.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

30. I shy away from social situations due to my limited English.

Never	Sometimes	Often	All the time			
①	②	③	④	⑤	⑥	⑦

5. When I am in my apartment, I typically speak English.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

6. My closest friends are Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

7. I think as well in English as I do in Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

8. I sometimes feel that neither Americans nor Chinese like me.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

9. If I were asked to write poetry, I would prefer to write it in English.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

10. I prefer going to social gatherings where most people are Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

11. I have both American and Chinese friends.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

12. There are times when I think no one understands me.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

13. I get along better with Americans than with other Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

14. I feel that other Chinese treat me as an equal more so than Americans do.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

15. I feel that both Americans and other Chinese value me.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

16. I sometimes find it hard to communicate with people in general.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

17. I feel that Americans understand me better than other Chinese do.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

18. I would prefer to go out on a date with a Chinese than with an American.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

19. I feel very comfortable around both Americans and Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

20. I sometimes find it hard to make friends.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

21. I find it easier to communicate my feelings to Americans than to other Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

22. I feel more relaxed when I am with other Chinese than I am with Americans.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

23. Sometimes I feel that Chinese and Americans don't accept me.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

24. I feel more comfortable socializing with Americans than I do with Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

25. Chinese should not date non-Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

26. Sometimes I find it hard to trust both Americans and Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

27. Most of my friends at school are Chinese.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

28. I find that both Chinese and Americans have difficulty understanding me.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

29. I find that I do not feel comfortable when I am with other people.

Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Agree Strongly
①	②	③	④	⑤	⑥	⑦

APPENDIX J – Northeastern University IRB Approval Notification



Northeastern

NOTIFICATION OF IRB ACTION

Date: October 12, 2016 IRB #: CPS16-09-01

Principal Investigator: Yufeng 'Jennifer' Qian
James Stephen Lee

Department: Doctor of Education
College of Professional Studies

Address: 20 Belvidere
Northeastern University

Title of Project: Acculturation Strategy, Acculturative Stress
and Academic Performance in First-Year
Chinese International Students at an American
College

Participating Sites: Data agreement on file

Approval Status: Approved

DHHS Review Category: EXEMPT, CATEGORY #4

*Human Subject Research
Protection*

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C. Randall Colvin, Ph.D., Chair
Northeastern University Institutional Review Board

Nan C. Regina, Director
Human Subject Research Protection

This approval applies to the protection of human subjects only. It does not apply to any other university approvals that may be necessary.

No further action or IRB oversight is required, as long as the project remains the same. However, you must inform this office of any changes in procedures involving human subjects. Changes to the current research protocol could result in a reclassification of the study and further review by the IRB.

