Asian Indian International Students’ Trajectories of Depression, Acculturation, and Enculturation

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The present study examined group-based differences in depression, acculturation, and enculturation trajectories and identified predictors of depression trajectories for 114 Asian Indian graduate students during their first academic year in the United States. Using group-based trajectory modeling, we identified the following 3 depression trajectories: students in the low-improving group began the year with relatively few depressive symptoms, which further decreased over time; students in the high-stable group began the year with few depression symptoms, which remained stable over time; and students in the high-declining group initially had the highest depressive symptomatology, and their symptoms worsened over time. Acculturation trajectories included a low-decreasing group that had the lowest acculturation level initially and became even less acculturated over time; a high-stable group that had consistently high acculturation; and a mid-stable group that had consistently moderate levels of acculturation. Enculturation trajectories included a low-decreasing group that had a relatively lower level of initial enculturation and experienced a reduction in enculturation over time, and a high-stable group that showed high levels of enculturation that remained stable over time. One-way analyses of variance (ANOVAs) indicated that higher acculturation, a greater number of in-group sources of support, fewer academic and financial concerns, and lower perceived degree of adjustment at the beginning of the study significantly distinguished among depression trajectories, with the largest differences typically seen between the low-improving and high-declining groups. Recognition of distinct depression, acculturation, and enculturation patterns and predictors of depression can strengthen support services for Asian Indian international students in U.S. universities.

Keywords: international students, acculturation, depression, social support, Asian Indian

Asian Indian graduate students have comprised the largest or second largest ethnic group of international students on American college campuses since 2000 (Institute of International Education [IIE], 2013), but little is known about their psychological adjustment patterns and acculturation process during their initial transition to the United States. At this writing, we are aware of only two studies of mental health that exclusively focused on Asian Indian international students in the United States (Atri, Sharma, & Cottrell, 2006; Rahman & Rollock, 2004), and two additional studies that included a substantial number of Asian Indian international students in their sample (Rice, Choi, Zhang, Moreiro, & Anderson, 2012; Tochkov, Levine, & Sanaka, 2010); none of these studies examined psychological adjustment or acculturation/enculturation processes across multiple time points. Although Asian Indian students may be partially buffered from transitional stress by their higher English proficiency compared with students from other Asian countries (Educational Testing Services [ETS], 2007), they, like other international students, are at risk of experiencing difficulties in their psychological and cultural adjustment period (Zhang & Goodson, 2011). Notable societal differences between the United States and India, with Indian culture featuring generally more traditional gender roles and attitudes (Deoshale & Hennon, 2008), strong reliance on interdependence and connectedness with family members throughout the life span (Verma & Triandis, 1999), and expectations of maintaining a deferential and nonconfrontational stance toward teachers (Milner, 2009) may uniquely affect Asian Indian international students’ expectations while studying in the United States. A crucial step toward developing effective supports for Asian Indian international graduate students transitioning to the United States via academic institutions involves understanding possible patterns of psychological adjustment and acculturation/enculturation and identifying factors that contribute to psychological adjustment outcomes.

Conceptual Framework

Our work builds on existing theoretical models that provide insight into the nature of psychological adjustment and acculturation trajectories among international students. Theoretical models of culture shock posit a “U-shaped” trajectory of adjustment characterized by a curvilinear relationship between length of time in the United States and cultural and psychological adjustment...
students’ transition to the United States. We will review this literature, and then use both existing theory and empirical research to propose a testable model of Asian Indian international students’ adjustment trajectories.

The recovery and adjustment stages are characterized by increasing positive affect and the ability to negotiate differences between the home and host cultures, suggesting a possible association between acculturation and psychological adjustment (Oberg, 1960). Acculturation, or the degree to which individuals adopt behaviors, values, and attitudes of the host society, and enculturation, which refers to the degree to which they maintain orientation toward their culture of origin are significant processes accompanying one’s transition to a new country (Berry, 2001). In Berry’s (2001) bilinear model, acculturation and enculturation exist simultaneously and may change at different rates depending on an individual’s context and personality.

Additional theories highlight factors that may account for differences in psychological adjustment trajectories during the transition to the United States. Lazarus and Folkman’s (1984) stress and coping theory suggests that one’s response to a stressor depends on (a) one’s initial appraisal of the significance of the stressor, (b) a secondary appraisal evaluating one’s coping resources, and (c) application of available coping strategies for the particular situation. This framework provides one possibility for understanding life transitions and subsequent psychological adjustment among international graduate students, for whom outcomes may vary depending on their appraisals and availability of coping resources following arrival in the United States.

Changes in one’s lifestyle, values, and/or attitudes during the acculturation process have the potential to incur psychological distress, particularly if individuals lack the necessary means to cope with the discrepancies (Berry, 2001). The multidimensional individual difference acculturation (MIDA) model (Safdar, Lay, & Struthers, 2003) extends Berry’s theory by incorporating individual-level predictors of adjustment that are grouped into the two domains of “resources” (e.g., in-group and out-group support and language/communication skills), and “impediments” (e.g., general and acculturative hassles). Of the various acculturation models (see Smith & Khawaja, 2011 for a review), we chose to use Berry’s framework and the MIDA model to guide the present study because these models acknowledge the concurrent processes of acculturation and enculturation during immigrants’ adjustment period, feature adjustment predictors with particular relevance to Asian Indian international students, and because the MIDA model has previously demonstrated promise in research with Asian Indian immigrants (Safdar, Calvez, & Lewis, 2012) and international students (Rasmi, Safdar, & Lewis, 2009).

Very little empirical research has evaluated these theories with regard to Asian Indian international students’ transition to the United States. There is a small and broader body of research on international students’ adjustment, and a somewhat larger literature on immigrants in general that may be relevant to understanding international Asian Indian students’ adjustment trajectories. We will review this literature, and then use both existing theory and empirical research to propose a testable model of Asian Indian students’ transition to the United States.

Empirical Studies on Patterns of International Students’ Psychological Adjustment

Stage models for culture shock were in favor for several decades, especially after a cross-sectional study of 200 Norwegian Fulbright scholars in the United States documented the U-shaped trajectory (Lysgaard, 1955). In recent years, these models have sometimes been considered “overgeneralized” (Church, 1982, p. 542) for their limited identification of only one trajectory of adjustment. In contrast to the U-curve, several studies have found that psychological difficulties occur much earlier in international students’ transition to the United States (Buddington, 2002; Cemil & Falbo, 2008; Jung, Hecht, & Wadsworth, 2007; Reynolds & Constantine, 2007; Wei, Heppner, Mallen, Ku, Liao, & Wu, 2007; Ye, 2006; Ying & Liese, 1991). In two longitudinal studies that assessed depression four times during international students’ first year studying in New Zealand (Ward & Kennedy, 1996; Ward, Okura, Kennedy, & Kojima, 1998), depression was highest soon after arrival and typically improved four to six months after transition; this improvement may be likened to the end stages of “recovery” and “adjustment” in Oberg’s model, even though findings do not perfectly map onto the U-shaped trajectory. Hechanova-Alampay, Beehr, Christiansen, and Van Horn (2002) examined international and domestic students’ psychological “strain” at three time points in the first six months of the academic year using a measure developed from items in the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977) and Cultural Adaptation Pain Scale (Sandhu, Portes, & McPhee, 1996). Of the three time points during which data were collected, strain was highest for both international and domestic students three months into the first semester. This finding suggests that students’ mood may coincide with the demands of the academic cycle, which is somewhat consistent with the U-shaped trajectory of adjustment. Ying and Liese (1991) assessed depressive symptoms among Taiwanese students studying in the United States pre- and postarrival and reported that half of students’ mood declined whereas the rest either exhibited improved mood or no change. Mixed findings of adjustment patterns warrant further examination and suggest the possibility of more than one trajectory among international students.

To our knowledge, four studies have assessed psychological adjustment of Asian Indian international students in the United States. Rice and colleagues (2012) found that acculturative stress was more strongly related to depressive symptoms (measured by the CES-D) for Asian Indian students compared with Chinese students. Rahman and Rollock (2004) used the CES-D to categorize a cross-sectional sample of Asian Indian undergraduate and graduate students using cutoff scores of 8, 16, and 17 into minimal, at-risk, and clinically significant groups, and found that 52.3% of students were in the clinically significant group. Tochkov et al. (2010) compared Asian Indian international students with American freshman of varying ethnicities and found that American students were more depressed based on their Beck Depression Inventory scores; however, Asian Indian students who had lived in the United States longer reported higher levels of homesickness. Atri et al. (2006) used the Kessler Psychological Distress Scale K-6 to measure mental health of Asian Indian international students but did not report score means; instead, the authors tested the predictive value of social support, acculturation, and hardiness on
mental health. Although these findings are noteworthy, significant gaps still exist in the literature. For example, none of the aforementioned studies used a longitudinal design, and only one study included a sample of students beginning in their first academic year in the United States (Rice et al., 2012) limiting knowledge of the course of psychological adjustment and acculturation/enculturation trajectories among Asian Indian international students. Additionally, predictors that may be particularly relevant to Asian Indian students’ psychological adjustment, such as gender role attitudes and culturally based coping styles, were not assessed in any of these studies. Finally, no studies have considered the possibility of multiple, distinct trajectories of psychological adjustment, acculturation, or enculturation among Asian Indian students.

Empirical Studies on Predictors of International Students’ Adjustment

Theory suggests that acculturation, social support, coping strategies, academic/cultural stressors, and societal discrepancies all contribute to international students’ adjustment to the United States, and these factors have also been supported by empirical research (Ward & Kennedy, 1996; see Zhang & Goodson, 2011 for a review).

Acculturation and enculturation. Two studies have examined the relationship between acculturation and psychological adjustment among Asian Indian international students and used the American Relations Scale and Majority-Minority Relations Scale to assess acculturation (Atri et al., 2006; Rahman & Rollock, 2004). In both of these studies, higher acculturation predicted fewer depressive symptoms. Neither of these studies examined enculturation, nor did they assess acculturation at more favorable psychological outcomes (Diwan, Jonnalagadda, & Balaswamy, 2004; Farver, Bhadha, & Narang, 2002), whereas others suggest that the strategy of integration is associated with poor psychological adjustment (Inman et al., 2014). Findings may reflect variation in sample type, methodology, and the way acculturation is operationalized, and it is unlikely that a single, optimal strategy of acculturation following immigration exists. In a review of acculturation models, Smith and Khawaja (2011) emphasize that no one theoretical model best describes acculturation processes for international students, and that additional research is needed to explore predictors of adaptation. Longitudinal research may be particularly useful, because it can illuminate how this process unfolds and determine the role that early experiences play in later functioning.

Social support. Social support serves to buffer life stress (Ye, 2006) and appears to be particularly important for the psychological adjustment of international students (Chavajay, 2013; Zhang & Goodson, 2011). International students may be particularly reliant on in-group social support such as family members and co-nationals (Kashima & Loh, 2006; Yan & Berliner, 2011; Yeh & Inose, 2002). Support from the host culture, which may be generally categorized as the “out-group,” is also a significant factor in international students’ adjustment, although typically less utilized than in-group support (Brein & David, 1971; Yan & Berliner, 2011). Atri and colleagues (2006) examined social support in an Asian Indian international student sample using the Interpersonal Support Evaluation List and found that the amount of emotional support one had significantly predicted mental health. Instrumental (practical) support was not found to be associated with mental health in Atri et al.’s sample, although this type of support has been thought to influence psychological and cultural adjustment (Chavajay, 2013; Ong & Ward, 2005), and may be especially important for recently arrived international students who depend on tangible support from peers, graduate program faculty, and/or university administrators to begin the settling in process.

Coping strategies. Coping involves “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands” (Lazarus & Folkman, 1984, p. 141). In collectivistic cultures, there is a greater focus on striving for connectedness and social harmony and utilizing social support when encountering a stressor (Inman & Yeh, 2007) rather than confronting a problem aggressively or independently, and it is possible that cultural norms of responding to difficulties play a role in determining which coping strategies are predictive of psychological outcomes. We did not find any studies that specifically examined coping strategies among Asian Indian international students, although Du and Wei (2015) found that social connectedness played an important role in mediating the relationship between acculturation, enculturation, and subjective well-being for Chinese international students. Inman et al. (2014) emphasize the need for more research on coping practices in the South Asian community since they are likely based on cultural beliefs and values. For example, seeking counseling may not necessarily be a preferred method for addressing difficulties for many Asian Indian international students because of cultural attitudes that discourage airing personal problems with an outsider (Panganamala & Plummer, 1998) and/or due to the stigma associated with mental illness. Thus, it is important to understand alternate coping strategies, and whether they distinguish psychological adjustment trajectories within this group.

Academic and financial concerns. Adjustment to a new educational system has frequently been a source of stress for many international students (Reynolds & Constantine, 2007; Wei et al., 2007). Academic challenges and unfamiliarity with the U.S. education system can create feelings of frustration, confusion, and incompetence. Lower levels of competence in work efficacy and social/personal interactions were predictive of higher levels of depression among South Asian international students (Rahman & Rollock, 2004). Inadequate financial resources have been found to predict a decline in well-being among Taiwanese international students (Ying & Liese, 1991); this concern may similarly affect Asian Indian students due to the comparatively high cost of living in the United States. Tochkov et al. (2010) found that the availability of financial aid was related to less homesickness among Asian Indian students in their sample. Thus, academic and financial concerns are likely to be among the most salient issues that arise for international students upon their arrival in the United States, and it is necessary to consider these factors during their adjustment period.
Societal discrepancies. Discrepancies in societal standards between the home and host culture have significantly predicted international students’ mental health following migration, with larger discrepancies associated with greater mental health difficulties (Yang & Clum, 1994; Ying & Liese, 1991). We draw upon research conducted with the general Asian Indian immigrant community in the United States to highlight these cultural differences. Although there is considerable diversity among Asian Indian immigrants, they often maintain close ties with their relatives in India, think collectivistically about themselves in relation to others (Rastogi, 2007), and typically possess attitudes reflecting more stereotypical gender roles, with the expectation that women should retain traditional values and practices in order to successfully transmit the culture to future generations (Navsaria & Petersen, 2007). Thus, because of distinct differences between Asian Indian and American cultures, the adjustment period for Asian Indian international students may be especially difficult for those who experience greater “culture shock” as their own beliefs come into conflict with commonly held beliefs in the United States.

Proposed Model of Adjustment for Asian Indian International Graduate Students

This study tests a proposed model of adjustment among Asian Indian international graduate students that addresses both the nature of trajectories of adjustment as well as predictors of those trajectories. With respect to the nature of trajectories of adjustment, in line with Berry’s (2001) theory of acculturative stress, we propose that there will be heterogeneity in students’ trajectories of depression symptoms, acculturation, and enculturation. Applying U-shaped theories of adjustment (Adler, 1975; Oberg, 1960), we propose that at least one type of depression trajectory will follow a U-shaped pattern characterized by increasing difficulties followed by a period of improvement. With respect to predictors of group-based differences in these trajectories, we integrate ideas from the stress and coping literature (Lazarus & Folkman, 1984), the MIDA model (Safdar et al., 2003), and Berry’s (2001) theory of acculturative stress, along with the existing knowledge base regarding predictors of psychological adjustment of international students. In this model (Figure 1), we conceptualize moving to the United States as a stressor, with depression as an outcome predicted by Asian Indian international students’ primary appraisal of the significance of the stressor, secondary appraisal of available resources, and subsequent utilization of coping strategies. In particular, we conceptualize perceptions of academic/financial concerns and the societal discrepancies they experience between India and the United States as two important indicators of the students’ appraisals of the significance of moving to the United States as a stressor, and perceived in-group and out-group social support as indicators of students’ appraisals of available resources. We posit further that culturally relevant coping strategies are then utilized based on these primary and secondary appraisals. Applying Berry’s (2001) framework and drawing from existing empirical data on acculturation within the Asian Indian immigrant community, additional predictors in our proposed model include the degree to which one is acculturated (i.e., reflective of American values, behaviors and attitudes) and the degree to which one is enculturated (i.e., identification with Indian values, behaviors, and attitudes), since differences in these levels are likely to impact depression.

The Present Study

Our goals for the present study were to (a) examine individual differences in trajectories of depressive symptoms, acculturation, and enculturation among Asian Indian international graduate students in their first academic year in the United States, and (b) identify the extent to which various factors may predict group-based differences in trajectories of depressive symptomatology. Our research questions were as follows:

![Figure 1. Model of Asian Indian international students’ psychological adjustment in the United States. See the online article for the color version of this figure.](image-url)
Question 1: Are there distinct trajectories of depressive symptoms among Asian Indian international graduate students during their first academic year in the United States?

We hypothesized that Asian Indian international students would exhibit multiple trajectories of depressive symptomatology and expected that one group would show a curvilinear trajectory in depressive symptoms (as suggested by the U-shaped curve), but that additional groups would show different patterns of symptomatology.

Question 2: Are there distinct trajectories of acculturation and enculturation for Asian Indian international graduate students during their first academic year in the United States?

We hypothesized that Asian Indian international students would exhibit multiple distinct acculturation and enculturation trajectories. Based on acculturation literature and bidimensional theories of cultural adaptation, we hypothesized that the majority of students in our study would begin the year with low acculturation and high enculturation and that different trajectories would emerge over the course of the year. We predicted that these trajectories would reflect increasing, decreasing, or relatively stable acculturation. Because our study sought to follow students during their first academic year in the United States, we expected there to be less variability in enculturation trajectories, with little to no change occurring for most students, and a gradual decline for others.

Question 3: Do acculturation, enculturation, social support, coping strategies, academic and financial concerns, and societal discrepancies (as measured by gender role attitudes and perceptions of the size of the adjustment during the transition) predict differences in trajectories of depressive symptoms among Asian Indian international graduate students?

Based on existing theory and research, we hypothesized that the healthiest trajectories of psychological adjustment (as demonstrated by consistently low symptoms of depression and/or decreasing symptoms of depression over the academic year) would be predicted by higher acculturation, higher enculturation, greater in-group and out-group support, the use of collectivistic coping strategies such as seeking and building relationships with co-nationals, fewer academic and financial concerns, less traditional gender role attitudes, and a smaller perceived degree of adjustment to the United States.

Method

Participants

One hundred fifty-nine Asian Indian international graduate students from 34 U.S. universities enrolled in this study at the beginning of their first academic year in the United States and were surveyed five additional times during the 9-month academic year. The number of respondents at subsequent time points were as follows: Time 2: n = 114; Time 3: n = 104; Time 4: n = 82; Time 5: n = 72. Time 6: n = 77; 51 students participated in all six time points. Students who completed at least two time points (n = 114) were included in the present study. The average age for students was 24.1 years at Time 1 (range = 21.2 to 35.3 years), 66% were male, 76% were enrolled in master’s programs, and 24% were enrolled in doctoral programs. Students pursued degrees in engineering (46%), computer science (15%), business (9%), social science/humanities (8%), physical sciences (8%), and other fields (14%), including architecture, public health, and public administration.

We found no significant differences on age, sex, major, Time 1 depression score, or on Time 1 predictors between students in the present study and students who completed only Time 1, except that there were slightly more students pursuing doctoral degrees in the present study (p = .03).

Procedure

Students were eligible for the study if they were (a) an international graduate student from India; (b) starting their first semester of graduate study in the United States; and (c) had not previously lived in the United States for six or more consecutive months prior to Time 1. Study enrollment and completion of Time 1 occurred in person and online, and we sent surveys for the subsequent five time points to students’ e-mail addresses through www.surveymonkey.com. Students were recruited in person during an on-campus orientation event organized by the Indian Student Association at the authors’ institution. We also recruited online by e-mailing a brief study description and flyer to Indian student organizations and/or general graduate student associations at the 20 U.S. institutions with the largest number of international students (IIE, 2007) and posted to Asian Indian student online forums and electronic listservs listed on www.facebook.com, www.orkut.com, and Google and Yahoo! Groups.

Using Hechanova-Alampay’s et al. (2002) study schedule as a guide, our survey time points were designed to coincide with the cycle of the academic calendar. Students attending universities on a semester schedule were sent survey links two weeks, eight weeks, and 14 weeks into each semester. Students on a trimester schedule were sent survey links during the first and seventh week of each trimester. We chose six time points to maximize the accuracy of group-based trajectories without overburdening participants, which would increase attrition. The survey window was open for four weeks after the survey was sent at each time point, and we sent weekly reminders to students who had not completed the survey until the window closed; during the last reminder, students were asked to complete only the depressive symptomatology measure since this was the primary outcome variable of the study. At each time point, students were entered into a drawing for one of four $25 Amazon gift cards. To further incentivize potential participants who may not have been motivated by the drawing, a $0.50 donation was made on each participants’ behalf to the Akshaya Patra Foundation, a well-known charity among Asian Indians that provides lunches for schoolchildren across India. The amount of money donated was doubled if participants completed all time points of the study (up to $6 per participant).

Measures

All measures for this study were administered in English because it is one of two official languages in India and because Asian Indian students scored higher than average on the Test of English as a Foreign Language in the years preceding data collection for the present study (ETS, 2007). Three Asian Indian international
graduate students at the authors’ institution (who were ineligible for the study) reviewed and provided feedback for the survey. None of the measures were previously normed on Asian Indian samples.

Measure administration varied across time points. We measured depressive symptomatology, academic and financial concerns, and perceived size of adjustment at all six time points because these measures were relatively brief and because depressive symptomatology was our primary outcome for the study. Other measures were generally alternated across time points to reduce burden on students and to increase participation rates. Acculturation, enculturation, and gender role attitudes were assessed at Times 1, 3, and 5, and we also measured acculturation and enculturation at Time 6 in order to have endpoint data for group-based trajectory modeling of these variables. Social support and coping strategies were initially measured at Time 2 (and again at Times 4 and 6) in order to give students time to develop and use sources of support and coping strategies in response to specific stressors after arriving in the United States. For all variables except depression, acculturation, and enculturation, only data gathered from the first time point that a measure was administered were used for this study; additional time points of data were collected to address other potential research questions not included in this study.

Demographics. Participants completed a demographic questionnaire at Time 1 to report their age, sex, field of study, and U.S. university.

Depressive symptomatology. Depressive symptoms were measured using the Boston × 4 CES-D (Kohut, Berkman, Evans, & Corno-Huntley, 1993), a shortened version of the CES-D scale. Using a Likert scale from 0 (rarely or never) to 3 (most or all of the time), participants respond to 10 items describing symptoms they may have experienced over the past week; a score of 10 or higher indicates clinically significant depressive symptoms. Compared to four other abbreviated versions of the CES-D, the Boston × 4 CES-D had the strongest psychometric properties with acceptable reliability, sensitivity, and specificity; studies with seven distinct groups of Mexican immigrants yielded alphas ranging from .71 to .84, with a total sample alpha of .79 (Grzywacz, Hovey, Seligman, Arcury, & Quandt, 2000).

Acculturation and enculturation. Participants completed the Culture of Origin (CO) and European American (EA) subscales of the Asian American Multidimensional Acculturation Scale (AA-MAS; Gim Chung, Kim, & Abreu, 2004). The AA-MAS is a multidimensional measure developed on the principle of orthogonality of cultural dimensions, and yields separate enculturation (AA-MAS-CO) and acculturation (AA-MAS-EA) scores. The AA-MAS has been tested across a number of college student populations of varying Asian descent, and has good test-retest reliability over a 2-week period (stability coefficients of .89 for the AA-MAS-CO and .78 for the AA-MAS-EA). Cronbach’s alpha was .89 for the AA-MAS-CO and .80 for the AA-MAS-EA subscale (Gim Chung et al., 2004).

Social support. For this study, we were interested in the number of sources and degree of in-group and out-group support that students perceived were available based on the finding that international students tend to rely heavily on members of the in-group but that support from the out-group is also an important buffer of psychological and academic distress (Brein & David, 1971). Following an extensive review of social support measures (Ong & Ward, 2005; Procidano & Heller, 1983; Ray & Miller, 1994; Zimet, Dahlem, Zimet, & Farley, 1988), we developed a social support questionnaire that included 10 potential sources of support thought to be important for students in this study, including six in-group (family in India, friends in India, family in the United States, the local Asian Indian community, Asian Indian friends in the United States, and Asian Indian student organization(s) on campus), and four out-group (non-Asian Indian international students on campus, American students, other student organizations, and faculty/department) sources. Students first indicated their perception of the availability (yes/no) of each source of support and then used a 4-point Likert scale ranging from not at all to very much to indicate how much emotional and practical support they received from each source.

An exploratory factor analysis on the 20 items (10 ratings of emotional and practical support from each source) using principal components analysis with promax rotation yielded initial eigenvalues with strong support for a two- or three-factor solution. We chose the two-factor solution which explained 47% of the variance, appeared to correspond with in-group and out-group support, and was consistent with existing theory. We dropped practical and emotional support from the Asian Indian community because these items loaded on the out-group factor, which was inconsistent with theory. Practical and emotional support from faculty/department did not load on either factor so they were also dropped. Emotional and practical support from family in India, friends in India, family in the United States, Asian Indian friends in the United States, and Indian organizations on campus (10 items) loaded on the in-group factor, and emotional and practical support from non-Indian international students, American students, and other campus organizations loaded on the out-group factor (6 items). This measure yielded four scores: (a) the number of in-group sources of support, (b) the number of out-group sources of support, (c) the degree of support received from in-group sources, and (d) the degree of support received from out-group sources. Cronbach’s alpha across the three time points that this scale was administered was an average of .86 for in-group support and .82 out-group support.

Coping strategies. Participants were administered the Social Activity, Intracultural Coping, Relational Universalism, and Fatalism subscales from the Collectivistic Coping Scale (CCS; Yeh, Chang, Arora, Kim, & Xin, 2003) to assess their coping style after identifying a specific problem/stressor that they had encountered in the preceding month. Alphas for each of the four CCS subscales were .90, .94, .91, and .80, respectively.

Academic and financial concerns. We created a brief questionnaire consisting of five items that assessed students’ concerns with understanding and communicating in English, being evaluated for their academic performance, adjusting to the academic system, and finances. Other validated scales that asked questions of this nature were longer and focused on broader constructs such as general hassles, and it seemed more appropriate and less burdensome on the students in our sample to include only questions that were relevant to our study hypotheses. Students used a 5-point Likert scale ranging from not at all to very much to respond to each item, and a single score was derived from averaging the five items. The average internal consistency of this scale across the six time points was .66.

Societal discrepancies. We assessed societal discrepancies using two indicators: gender role attitudes and perceived degree of adjustment to the United States. Gender role attitudes were measured...
with the Social Roles Questionnaire (Baber & Tucker, 2006), which contains 13 items corresponding to the Gender Transcendent (GT) and Gender-Linked (GL) subscales. The GT scale, consisting of five items ($\alpha = .65$), reflects attitudes of individuals who do not believe that roles and tasks should be solely based on one’s gender, whereas the GL subscale ($\alpha = .75$) contains eight items that indicate the appropriateness of social roles and behaviors for either men or women, but not for both. Participants respond to items in 10% increments, where $0\% = \text{strongly disagree}$ and $100\% = \text{strongly agree}$, and all five items of the GT scale are reverse coded. Higher scores reveal more traditional attitudes.

We asked students two questions regarding their perceived degree of adjustment: (a) the size of adjustment they made since moving to the United States, answered based on a 4-point Likert scale ranging from very large to very small, and (b) how they felt about their ability to adjust to life in the United States, on a 4-point Likert scale that ranged from very bad to very good. Higher scores indicated a smaller adjustment and more positive feelings about adjusting to the United States. These two items were averaged to create an overall adjustment score at each time point; the average correlation across the six time points was .33.

Analytic Plan

Semiparametric modeling (Nagin, 1999) using the PROC TRAJ program in SAS identified commonly occurring trajectories of depressive symptoms, acculturation, and enculturation (Questions 1 and 2) from the empirically derived data, and best fit models were chosen using the Bayesian information criteria (BIC; Nagin, 1999). Nagin and Tremblay’s (2005) trajectory modeling technique is ideal for examining group-based differences, since this method does not assume one standard developmental course for all individuals. Once group trajectories are determined, it is possible to (a) estimate the likelihood that any given individual would be a “member” of a particular group, and (b) evaluate predictors of group membership.

The semiparametric modeling method utilizes a polynomial function to estimate the relationship between the variable in question and the specific time point. This general function takes the form

$$y_{it} = \beta_0 + \beta_1(time)_it + \beta_2(time^2)_it + \varepsilon$$

where $y_{it}$ is a latent variable that measures the level of the construct for participant $i$ at time $t$ given membership in group $j$. Time was coded as the time point (1–6) during which data were collected. The coefficients of the model varied across groups and ultimately determined the shape of each trajectory.

To address the third question, we ran one-way ANOVAs to compare individuals from different depressive symptomatology trajectories on each of the predictor variables. We followed up significant ANOVAs with Tukey’s honestly significant difference (HSD) tests to compare each pair of groups and used an alpha value of .01 to limit Type I error.

Results

Descriptive Statistics

Table 1 shows means, standard deviations, and intercorrelations for all variables at Time 1 and Time 2. Notably, a higher Time 1 Boston × 4 CES-D score (i.e., greater depressive symptoms) was associated with lower acculturation, greater perceived degree of adjustment, greater academic and financial concerns at Time 1, and fewer Time 2 in-group supports. Higher Time 1 acculturation was related to fewer Time 1 academic and financial concerns and a lower perceived degree of adjustment, whereas higher Time 1 enculturation was associated with more in-group support received at Time 2.

Research Questions

**Question 1**: Are there distinct trajectories of depressive symptoms among Asian Indian international graduate students during their first academic year in the United States?

Linear and quadratic models with two, three, and four groups were fit using Boston × 4 CES-D data at each time point to determine which model yielded the best fit. A 3-group linear model (Table 2 and Figure 2a) appeared to be the optimal fit for describing the number and pattern of depressive symptomatology trajectories in this sample (BIC value $= -1535.59$). Students in the low-improving group ($n = 39$) had the fewest symptoms of depression (i.e., Lowest Boston CES-D score) at Time 1 and experienced a marginally significant linear reduction in symptoms by Time 6 ($p = .03$). Students in the low-stable group ($n = 60$) had few depressive symptoms at Time 1 and their scores remained relatively stable across all time points. Students in the high-declining group ($n = 15$) had the highest depressive symptomatology of all three groups at Time 1 and experienced a marginally significant ($p = .09$) linear increase in depressive symptoms over time.

**Question 2**: Are there distinct trajectories of acculturation and enculturation for Asian Indian international graduate students during their first academic year in the United States?

Acculturation and enculturation trajectories were estimated using the same PROC TRAJ procedure with the AAMAS-EA and AAMAS-CO subscales from Times 1, 3, 5, and 6. The linear model identified three distinct acculturation trajectories (Table 2 and Figure 2b) and had a BIC value of $-272.84$. The low-decreasing group ($n = 14$) initially had the lowest acculturation level of the three groups and this level decreased across time ($p = .01$). Acculturation levels in the mid-stable ($n = 55$) and high-stable group ($n = 23$) remained relatively stable over Time Points 1, 3, 5, and 6; the high-stable group exhibited the highest acculturation throughout the academic year.

A 2-group linear model (BIC $= -293.17$) was chosen for the AAMAS-CO subscale (see Table 2 and Figure 2c). The low-decreasing group ($n = 21$) had a lower level of enculturation than the high-stable group at Time 1 and experienced a significant linear decrease by Time 6 ($p = .009$). The high-stable group ($n = 71$) was characterized by high enculturation at Time 1, which remained stable across all time points.

**Question 3**: Do acculturation, enculturation, social support, coping strategies, academic and financial concerns, and societal discrepancies (as measured by gender role attitudes and perceptions of the size of the adjustment during the transition) predict differences in trajectories of depressive symptoms among Asian Indian international graduate students?

One-way ANOVAs were used to compare individuals who followed low-improving, low-stable, and high-declining depres-
<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. T1 Boston × 4 CES-D</td>
<td>7.24 (5.49)</td>
<td>114</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. T1 AAMAS: European Culture</td>
<td>3.72 (0.57)</td>
<td>-0.29</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3. T1 AAMAS: Culture of Origin</td>
<td>5.02 (0.56)</td>
<td>0.03</td>
<td>-0.04</td>
<td>1</td>
<td></td>
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<tr>
<td>4. T2 number of in-group sources of support</td>
<td>4.08 (1.00)</td>
<td>-0.34</td>
<td>0.13</td>
<td>0.14</td>
<td>1</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. T2 number of out-group sources of support</td>
<td>1.69 (1.13)</td>
<td>-0.14</td>
<td>0.25</td>
<td>-0.13</td>
<td>0.16</td>
<td>1</td>
<td></td>
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<tr>
<td>6. T2 degree of in-group support</td>
<td>2.39 (1.00)</td>
<td>-0.23</td>
<td>0.11</td>
<td>0.29</td>
<td>0.45</td>
<td>0.11</td>
<td>1</td>
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<tr>
<td>7. T2 degree of out-group support</td>
<td>1.40 (0.94)</td>
<td>0.16</td>
<td>0.14</td>
<td>-0.06</td>
<td>0.03</td>
<td>0.48</td>
<td>0.56</td>
<td>1</td>
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<tr>
<td>8. T2 CCS: Social Activity</td>
<td>3.93 (1.60)</td>
<td>-0.09</td>
<td>0.03</td>
<td>0.24</td>
<td>0.08</td>
<td>0.02</td>
<td>0.20</td>
<td>0.14</td>
<td>1</td>
<td></td>
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<tr>
<td>9. T2 CCS: Intra-cultural Coping</td>
<td>3.25 (1.69)</td>
<td>-0.15</td>
<td>-0.25</td>
<td>0.32</td>
<td>-0.02</td>
<td>-0.05</td>
<td>0.34</td>
<td>0.12</td>
<td>0.45</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. T2 CCS: Relational Universality</td>
<td>3.42 (1.67)</td>
<td>-0.16</td>
<td>-0.05</td>
<td>0.24</td>
<td>0.15</td>
<td>0.14</td>
<td>0.23</td>
<td>0.29</td>
<td>0.55</td>
<td>0.58</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. T2 CCS: Fatalism</td>
<td>3.95 (1.57)</td>
<td>-0.07</td>
<td>-0.15</td>
<td>0.13</td>
<td>0.05</td>
<td>0.04</td>
<td>0.19</td>
<td>0.15</td>
<td>0.35</td>
<td>0.31</td>
<td>0.45</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. T1 Academic and financial concerns</td>
<td>2.72 (0.88)</td>
<td>0.27</td>
<td>-0.30</td>
<td>-0.03</td>
<td>-0.24</td>
<td>-0.02</td>
<td>-0.08</td>
<td>-0.02</td>
<td>-0.08</td>
<td>0.15</td>
<td>0.07</td>
<td>0.03</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>13. T1 SRQ: Gender Transcendent</td>
<td>8.23 (8.43)</td>
<td>0.15</td>
<td>-0.05</td>
<td>-0.19</td>
<td>-0.19</td>
<td>-0.09</td>
<td>-0.18</td>
<td>0.10</td>
<td>-0.04</td>
<td>-0.15</td>
<td>-0.03</td>
<td>0.15</td>
<td>0.15</td>
<td>1</td>
<td></td>
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<tr>
<td>14. T1 SRQ: Gender Linked</td>
<td>31.16 (15.46)</td>
<td>0.20</td>
<td>-0.22</td>
<td>0.14</td>
<td>-0.06</td>
<td>-0.24</td>
<td>0.07</td>
<td>-0.11</td>
<td>-0.08</td>
<td>-0.13</td>
<td>-0.03</td>
<td>0.24</td>
<td>0.19</td>
<td>0.31</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15. T1 Perceived degree of adjustment</td>
<td>3.00 (0.62)</td>
<td>-0.54</td>
<td>-0.30</td>
<td>-0.30</td>
<td>-0.24</td>
<td>0.19</td>
<td>0.16</td>
<td>0.01</td>
<td>0.03</td>
<td>0.13</td>
<td>-0.00</td>
<td>-0.30</td>
<td>-0.08</td>
<td>0.03</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Sample size for each correlation is listed below the correlation coefficient.

*Sample size for the CCS subscales is comparatively low because there were 35 respondents who reported they had not experienced any problems in the previous month and thus did not have to complete the measure.

* * p < .05. † p < .01. ** p < .001.
sive symptomatology trajectories on measures of acculturation, enculturation, social support, coping strategies, academic and financial concerns, gender role attitudes, and perceived degree of adjustment. Mean group differences are shown in Table 3.

There were no significant differences between depressive symptomatology groups on enculturation at Time 1 \((p = .82)\), but differences among the three groups approached significance on acculturation at Time 1 \((p = .04)\). A post hoc Tukey’s HSD test indicated that students in the low-improving depressive symptomatology group had marginally higher acculturation at Time 1 than students in the high-declining group \((p = .03)\).

Depressive symptomatology groups differed significantly in the number of in-group sources of support they perceived having \((p = .001)\). The low-improving group had more in-group support sources than the low-stable group, which, in turn, had more in-group sources of support than the high-declining group. The difference between the low-improving and high-declining groups was significant \((p = .001)\), whereas the difference between the low-improving and low-stable groups approached significance \((p = .04)\). The degree of out-group support received did not distinguish depressive symptomatology trajectories, but differences between groups on the degree of in-group support and the number of

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group description</th>
<th>Intercept</th>
<th>Slope</th>
<th>p-value</th>
<th>n</th>
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</thead>
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<tr>
<td>Boston × 4 CESD</td>
<td>Low-improving</td>
<td>5.14</td>
<td>- .47</td>
<td>.03</td>
<td>39</td>
</tr>
<tr>
<td>Boston × 4 CESD</td>
<td>Low-stable</td>
<td>8.13</td>
<td>- .11</td>
<td>.58</td>
<td>60</td>
</tr>
<tr>
<td>Boston × 4 CESD</td>
<td>High-declining</td>
<td>12.27</td>
<td>.53</td>
<td>.09</td>
<td>15</td>
</tr>
<tr>
<td>AAMAS: European American Culture</td>
<td>Low-decreasing</td>
<td>3.47</td>
<td>- .11</td>
<td>.01</td>
<td>14</td>
</tr>
<tr>
<td>AAMAS: European American Culture</td>
<td>Mid-stable</td>
<td>3.58</td>
<td>.04</td>
<td>.10</td>
<td>55</td>
</tr>
<tr>
<td>AAMAS: European American Culture</td>
<td>High-stable</td>
<td>4.50</td>
<td>.02</td>
<td>.56</td>
<td>23</td>
</tr>
<tr>
<td>AAMAS: Culture of Origin</td>
<td>Low-decreasing</td>
<td>4.57</td>
<td>- .09</td>
<td>.01</td>
<td>21</td>
</tr>
<tr>
<td>AAMAS: Culture of Origin</td>
<td>High-stable</td>
<td>5.19</td>
<td>.01</td>
<td>.65</td>
<td>71</td>
</tr>
</tbody>
</table>

Figure 2. Depressive symptomatology, acculturation, and enculturation trajectories. See the online article for the color version of this figure.
out-group sources approached significance (both ps < .03). The low-improving group had more in-group support (p = .03) and a greater number of out-group sources of support (p = .02) than the high-declining group.

The low-improving group had significantly fewer academic and financial concerns (p = .004) and perceived the adjustment to the United States to be smaller (p = .007) compared with the high-declining group. The differences between these groups on gender roles approached significance; students in the low-improving group had fewer traditional beliefs about gender roles (p = .046). Coping strategies did not significantly distinguish different depressive symptomatology trajectories.

**Discussion**

This study examined trajectories of depressive symptomatology, acculturation, and enculturation among Asian Indian international graduate students during their first academic year in the United States and sought to identify predictors of depressive symptomatology trajectories. Our findings support the notion that Asian Indian international students follow multiple distinct psychological and cultural adjustment trajectories. Additionally, acculturation, social support, academic and financial concerns, and perceived degree of adjustment to the United States accounted for group-based differences in depressive symptomatology trajectories.

**Trajectories of Depressive Symptomatology, Acculturation, and Enculturation**

Unlike early theoretical models of international students’ adjustment that broadly describe psychological and cultural adjustment following migration with a U-shaped curve (Adler, 1975; Oberg, 1960), the present study identified substantial variation in these trajectories among the students in this sample. Inconsistent with U-shaped models, the majority of students in the current study experienced relatively low and stable depressive symptomatology over the course of their first nine months in the United States. The smallest depression trajectory group experienced relatively more depressive symptoms upon transition and continued to experience more symptomatology during the course of the academic year, similar to Cemalcilar and Falbo’s (2008) study. A third group reported the fewest depressive symptoms upon arrival and experienced a steady reduction in symptomatology during the year, perhaps reflecting a recovery from any minor adjustment issues they may have had when first arriving in the United States.

We also identified distinct acculturation and enculturation trajectories in this study. Approximately 25% of students reported consistently high acculturation throughout the year, whereas the other two groups began with lower identification to American culture and had divergent trajectories across the academic year. Regarding enculturation trajectories, a majority of students maintained a high level of identification with Indian culture throughout the study, whereas the second group began with lower enculturation and experienced a decrease over the year. Our findings support bilinear theories of acculturation, in which individuals can simultaneously endorse differing levels of acculturation and enculturation (Berry, 2001; Szapocznik, Kurtines, & Fernandez, 1980). We found greater variability in acculturation patterns compared with enculturation trajectories, suggesting that acculturation may be more susceptible to change than enculturation during one’s initial transition to the United States. The results corroborate Cemalcilar and Falbo’s (2008) findings in which international graduate students tended to maintain identification to their home culture while their identification to the U.S. culture increased. The distinct trajectories that emerged from the present study underscore the importance of recognizing group-based differences in patterns of depressive symptoms, acculturation, and enculturation. Applying averages and assuming that all individuals follow a
similar pathway masks the variability of developmental courses within a group.

**Predictors of Depressive Symptomatology Trajectories**

**Acculturation and enculturation.** Greater identification with American culture upon arrival was marginally predictive of improving depressive symptomatology during the year, whereas enculturation did not appear to play a significant role in this process. Students who arrived in the United States having greater familiarity with the English language, food, popular culture, and social norms may have experienced less of a culture “shock” (Oberg, 1960), making them less likely to experience depressive symptoms in their first few months of transition.

**Social support.** Consistent with other studies of international students’ psychological adjustment, social support was an important predictor of depressive symptomatology trajectories in this study (Ward et al., 1998; Yang & Clam, 1994). Both the number of in-group supports, as well as the degree to which members of one’s own community (e.g., familial, ethnic, academic, etc.) offered support, appeared to be particularly important in differentiating students whose depression improved and students whose depression worsened over the year. Relating to individuals with a similar ethnic background may protect international students from experiencing greater depressive symptoms. This may be especially true for new students who are dually managing the stressors of belongingness and companionship, as a significant predictor of students’ mental health. Reliance on the in-group was also demonstrated among Japanese university students who endorsed a preference for talking with friends and family in their social groups over seeking institutional support (Yeh, Inose, Kobori, & Chang, 2001). The number of out-group support sources marginally distinguished between students whose depressive symptoms improved and students whose symptoms worsened, suggesting that students in the former group may have been buffered against difficulties experienced later in the year because they felt more welcomed initially by non-Indian peers and other organizations on campus. It is also possible that these students felt more sources of support were generally available, whereas students with worsening depression had a more negative outlook on the number of sources and degree of support available to them.

**Coping strategies.** Contrary to our expectations, none of the coping strategies assessed in this study accounted for group-based differences in trajectories of depressive symptomatology. Although students from collectivistic cultures may be more prone to use strategies such as participating in social activities, seeking validation and support from other members of their ethnic community, and thinking fatalistically (Yeh et al., 2003), it is possible that Asian Indian students in this sample used a combination of these styles (e.g., social activity and fatalism) to cope with difficulties. Some of these coping combinations may have helped to lessen their depressive symptoms whereas others may have made students feel worse, so that collectivistic coping styles, as a whole, were unrelated to their symptomatology. Another possible reason we did not find a relationship between coping and depression may be that collective coping strategies do not help alleviate stress associated with societal discrepancies, and hence have limited effect on depression. There may be other coping strategies that do distinguish patterns of depressive symptomatology that were not assessed in this study.

**Academic and financial concerns.** As expected, compared with students whose depression worsened, students whose depressive symptomatology improved had fewer academic and financial concerns at the onset of the year. This finding was consistent with other studies that have found a positive relationship between financial concerns and symptoms of distress (Tochkov et al., 2010; Ying & Liese, 1991).

**Societal discrepancies.** Initial attitudes about gender ideology significantly distinguished students with improving depressive symptomatology from students with worsening symptomatology, with the latter exhibiting more traditional attitudes about gender. Gender roles in India are generally more conservative than those in the United States, even if this is a subtle distinction in urban cities. For students who arrived in the United States with stereotypical ideas about activities and abilities that are characteristic of men and women, it may have been surprising, and at times disconcerting, to experience the incongruity between their beliefs about gender and the values and attitudes expressed in the United States. Having a more flexible stance at arrival seemed to reduce depressive symptoms, since this perspective likely allowed students to settle into social and academic arenas with greater ease.

**Study Implications**

The results of this study have several implications for host academic institutions as well as for Asian Indian international students applying for admission to graduate programs in the United States. Immigration brings with it changes in nearly every facet of life, many of which may have a substantial impact on students’ psychological and cultural adjustment. This study demonstrates that not all students experience depression or worsening symptoms during the transition; in fact, many students tend to have consistently few or decreasing depressive symptoms during their first year in the United States. Asian Indian international students also vary in their degree of acculturation and enculturation, so it is inappropriate to assume that all international students from the same country will share the same values, beliefs, and practices and follow the same cultural adjustment process. Rather, there are likely multiple acculturation and enculturation strategies that are associated with positive psychological adjustment. Providing these data and/or training staff working in university counseling centers around the importance of considering several ways in which Asian Indian international students may (a) experience the transition to the United States, and (b) cope with associated challenges, could serve to broaden their assessment and intervention efforts when working with international students. Implementing targeted health promotion programs and offering group support sessions similar to
those designed by Carr, Koyama, and Thiagarajan (2003) could also focus on normalizing the possibility of different adjustment experiences for Asian Indian international students. These efforts may also be more effective if programs are developed and implemented in conjunction with senior graduate students from India who may be able to suggest specific topics of interest for new Asian Indian international students as they arise throughout the first year, perhaps first addressing more pressing concerns related to societal discrepancies and academic and financial questions. The role of in-group social support in promoting Asian Indian international students’ adjustment was noteworthy. Support from cultural student associations and co-nationals provides new students with a welcoming forum in which they can affirm their cultural identities, form fast and lasting friendships, and gain emotional support during their transition and, potentially, throughout their graduate school experience. For example, several Asian Indian student organizations provide practical support to potential and incoming students from India such as guidance during the application process and arranging for airport pick-ups just before the semester begins. Many organizations also hold a welcome party or orientation event (such as the one from which we recruited much of our sample) as a way to facilitate friendships and mentor relationships and to give new students a small feel of “home.” Universities and departments could be encouraged to provide greater resources to cultural student organizations on campus because of the notable impact they have on incoming students and for the burden that many of them bear in successfully incorporating international students into the university and graduate program culture.

Whereas in-group support plays an important role in international students’ settling in process, out-group support sources were also important in students’ psychological adjustment in this study. In addition to Indian student associations, other university clubs and organizations may potentially influence more positive adjustment outcomes for international students if they are perceived as providing encouragement, support, and guidance beginning with students’ transition to the United States. The students in this study also seemed to benefit from perceiving positive relationships with American students because this was an indication of being accepted into the host culture, and through these relationships, likely also expanded their knowledge about American culture and the U.S. educational system. Whereas some of this information can be passed on from co-nationals who have been in the United States for more time, universities might consider implementing cultural peer-mentoring programs for interested first-year international students or facilitate ways in which international students and American students can have greater interaction.

Limitations and Future Directions

Although this study provides a new perspective for understanding psychological and cultural adjustment patterns and predictors of depressive symptomatology for Asian Indian international graduate students, it is not without limitations. First, caution should be taken in generalizing findings from the study to all Asian Indian international students, other international student groups, nonstudent Asian Indian immigrants, and undergraduate international students. Second, the present study only focused on the first nine months in the United States; trajectories may differ during later periods of the transition. Third, although we chose a multidimensional questionnaire to simultaneously assess acculturation and enculturation, these processes are complex and present challenges in operationalization and measurement. Since measurement scales vary widely in the number of dimensions and types of subscales they use to assess acculturation and enculturation, it is possible that our study did not fully capture some of the domains in which students experienced change. Fourth, we did not examine students’ attitudes toward seeking help for psychological difficulties, and it is unclear whether the optimal intervention for Asian Indian international students in distress is through interventions such as therapy and counseling, as is often encouraged in United States universities. Fifth, although this was a longitudinal study, its correlational design limits causal conclusions. For example, students who entered the United States with fewer depressive symptoms may have more easily sought out social support and experienced a smoother transition. These same students may have been more likely to follow healthier trajectories of depression because their symptoms may have been more easily overcome over time. Sixth, using social media and e-mail listservs to recruit students may have increased sampling bias and raises concerns about the external validity of this study. Students in this study may differ from Asian Indian students who were not active in such groups. Similarly, it is possible that the use of online recruitment strategies for part of our sample discouraged some students from participating because of the impersonal nature of the invitation. The use of online surveys for Time Points 2–6 may have also increased attrition, which limits the power of our findings; a larger sample size using additional recruitment techniques would provide for a more robust study in the future.

Despite these limitations, this study offers new contributions to the literature and opportunities for increased research in this area. Extended study of Asian Indian international students beyond their first nine months in the United States is necessary for a more complete picture of depression and acculturation trajectories. Examining acculturation patterns over a longer time in the United States may shed light on specific changes in attitudes and behavior since this process takes time and likely differs across domains (Berry, Phinney, Sam, & Vedder, 2006). In future studies involving Asian Indian students, researchers may consider the role of other predictors of depressive symptoms and trajectories such as pre-arrival mood and perceived discrimination/prejudice, since these are likely to affect one’s adjustment to the United States (Rahman & Rollock, 2004; Ying & Liese, 1991). Other longitudinal studies could also examine the role of predictors of acculturation and enculturation trajectories to further knowledge on personality and contextual factors that influence cultural change at the individual level. As the United States continues to enroll large numbers of international students, it is crucial to focus efforts on understanding these and other factors that foster a successful psychological and cultural transition.

References


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