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Permalink

<https://escholarship.org/uc/item/8tg840vb>

Journal

Asian American Journal of Psychology, 5(3)

ISSN

1948-1985

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Publication Date

2014-09-01

DOI

10.1037/a0034908

Peer reviewed



Published in final edited form as:

*Asian Am J Psychol.* 2014 September ; 5(3): 252–261. doi:10.1037/a0034908.

## Assessing Acculturation Over Time: A Four-year Prospective Study of Asian American Young Adults

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### Abstract

Acculturation is commonly defined as a dynamic and multidimensional process in which individuals and groups change over time when coming into contact with another culture. Despite the emphasis on acculturation as a process of change over time, few researchers have directly assessed this hypothesis. The current study first identifies and then examines “stable” and “dynamic” dimensions of acculturation within a 4-year prospective study of 433 first- and second-generation Chinese- and Korean-American college students. Separate growth model analyses revealed significant linear change for first-generation students toward greater U.S. acculturation. In comparison, tests of linear and quadratic change for second-generation students were not significant. When stratifying by gender, acculturation increased for women but there was no significant change in acculturation for men. While all students reported increases in alcohol consumption over the study period, changes in acculturation predicted changes in alcohol consumption only for women. Chinese men showed greater increases in alcohol consumption than Korean men but there was no effect for ethnicity among women. There was significant individual variability in the models, which underscores the importance of examining change prospectively through within and between person analyses. The findings highlight the importance of examining acculturation changes over time for different migrant groups with implications for further development of acculturation measures, research methodologies, and health interventions. More

prospective research designs of acculturation are needed to examine changes in health behavior and overall adaptation across migrant groups at varying stages of development.

### Keywords

acculturation; measurement; college students; prospective study; growth modeling

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Global migration has increased from 150 million in 2000 to 214 million in 2010 and data suggest continued upward trends in human movement worldwide (International Organization for Migration, 2011). In the United States, immigrants make up 13% of the population (Britz & Batalova, 2013) with Asian Americans representing the fastest growing immigrant group (Pew Social & Demographic Trends, 2012). With rising immigration rates, it is increasingly important to understand the process of adaptation and acculturation experienced by immigrants when moving across borders and cultures. Changes in acculturation have been linked to both positive and negative changes in health and health behaviors (e.g. Lara, Gamboa, Kahramanian, Morales, & Bautista, 2012; Suinn, 2010). With better understanding of acculturation, interventions and programs can be designed to promote optimal adaptation and overall health and wellbeing for immigrants in the years and generations following international relocation.

Mirroring changes in the general population, undergraduate institutions in the U.S. are rapidly becoming more ethnically/racially diverse (Hussar & Bailey, 2009). The transition to college and adulthood is marked by rapid changes in environment and social roles. For many students, attending college may represent the first time they are living away from their family of origin, which is likely to provoke numerous changes in behavior and exploration of one's values and identity. In particular for racial/ethnic minorities, the years in university represent a time of exploration of one's ethnic identity (Phinney & Alipuria, 1990).

Similarly, there are rapid transitions in numerous health behaviors, such as high-risk drinking and cigarette smoking during the transition from adolescence to young adulthood (American College Health Association, 2011; Kwan, Carney, Faulkner, & Pullenayegum, 2012). The years during college represent an important developmental period for establishing healthy behaviors. To better meet the clinical and health needs of an increasingly diverse campus, programs and interventions must understand the cultural practices and beliefs that influence health and health behaviors in diverse populations (Pedersen, 1995). For immigrants, it is important to understand the influence of the acculturation process on changes in health behaviors.

Acculturation is commonly defined as a dynamic process in which individuals and groups change over time when coming into contact with another culture (Berry & Sabatier, 2011). Culture is a broad-reaching concept that is difficult to define and refers to visible features (e.g. food, clothing) and behaviors (e.g. language, rituals) as well as inferred psychological dimensions such as attitudes, beliefs, and values (Rudmin, 2009). The extent to which an individual adopts the new host country culture is thought to be independent of the extent to which an individual maintains his/her culture of origin (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Despite a considerable rise in research on the topic, acculturation has

proven to be a challenging construct to elucidate and assess. Research on acculturation is criticized for reasons such as: (1) weak and varying definitions of acculturation and culture; (2) inconsistent subscales identified across proposed measures both within and across various cultural groups; and, (3) a dearth of analyses examining how cultural attitudes, behaviors, and beliefs change over time (Castro & Murray, 2009; Chirkov, 2009; Hunt, Schneider, & Comer, 2004; Matsudaira, 2006; Rudmin, 2009).

The acculturation process includes a variety of dimensions that are hypothesized to change, including cultural practices, values, and identity (Schwartz et al., 2010). In a review, Matsudaira (2006) identified 51 different psychological acculturation measures published between 1978 and 2004. The review highlighted the dimensions of acculturation (i.e. unidimensional scales that assess change on a single continuum from culture of origin to host culture versus multidimensional scales that assess identification with the two cultures separately) and domains of change (e.g. language, food preferences, beliefs and attitudes) as critical components of variation across different measures, with identified measures ranging between 4 and 80 items in length and from providing a single total score or up to eight subscale scores. Primarily these scales ask for self-report on behaviors and beliefs such as linguistic skill and preference, social affiliations, and food preferences.

While acknowledging diverse conceptualizations and measurements of acculturation, in this research we utilize the Suinn-Lew Asian Self Identity Acculturation Scale (SL-ASIA; Suinn, Ahuna, & Khoo, 1992) in part because of its emphasis on behavioral changes that occur during acculturation (Suinn, 2010). Like many acculturation scales, the SL-ASIA has been harshly criticized for its unidimensional format (i.e. behaviors are assumed to move along a single continuum from greater Asian culture identification to greater American culture identification, with biculturalism occurring at the midpoint on the scale). Nonetheless, the SL-ASIA is one of the most widely used measures of acculturation across Asian populations and there are multiple scoring methods proposed and utilized for the scale (Abe-Kim, Okazaki, & Goto, 2001; Magaña et al., 1996). The multiple scoring options allow us to relate our findings to the existing published studies on acculturation in the Chinese and Korean communities studied herein. In addition, the behavioral emphasis of the SL-ASIA provides the opportunity to examine the relation between behavioral changes linked to cultural practices and traditions with changes in health behaviors, here, drinking alcohol. Health behaviors, which vary in prevalence across cultures, are directly linked to important health outcomes they can become important targets of health interventions.

The assessment of health behaviors among college students has been limited by examining largely White samples and examinations of Asian samples are limited when subgroups are not differentiated despite known differences in prevalence across Asian communities (Authors, 2009). For example, data from the 2001 California Health Interview Survey reveal that among Asian subgroups in California, the smoking prevalence rate was highest among Korean adults in California at approximately 21%, while the lowest rate was among Chinese adults at approximately 10% (Tang, Shimizu, & Chen, 2005). Similarly, there are differences across these two groups in alcohol use and binge drinking and examination of culture helps to clarify these findings.

Both Chinese and Korean cultures are influenced by Confucian philosophy, which emphasizes drinking in moderation (Bond & Hwang, 1986; Cheng, 1980). Korean culture, however, also places importance on men socializing together and drinking heavily, which may result in greater acceptance of heavy consumption and alcohol problems (Cho & Faulkner, 1993; Higuchi, Matsushita, Muramatsu, Murayama, & Hayashida, 1996; Park, Danko, Wong, Weatherspoon, & Johnson, 1998; Park, Oh, & Lee, 1998). It has been hypothesized that as Asian immigrants become more acculturated, their drinking patterns become more similar to the U.S. population (Chu et al., 1978; Sue, Zane, & Ito, 1979). In support of this hypothesis, levels of alcohol use and binge drinking in Asian American youth have been related to their level of acculturation (Hahm, Lahiff, & Guterman, 2003; 2004), although these studies did not disaggregate subgroups (e.g., Chinese and Korean) in their analyses.

In a cross-sectional study of 18 to 19 year-old first year college students, we found significant associations of sex, parental alcohol use, and acculturation with drinking (Authors, 2005). As predicted, those who were more acculturated drank more heavily when assessing heavy episodic drinking (i.e., consuming five or more drinks for men and four or more drinks for women during one drinking occasion; Wechsler et al., 1995). Despite low power to test interactions, we found that the effect of ethnicity on the relation between acculturation and heavy episodic drinking approached significance. This moderating trend indicated that a one-unit increase in acculturation score (toward greater affiliation with U.S. culture) corresponded with a four-fold increased risk for a heavy drinking episode in Chinese, but no increased risk in Koreans.

In order to understand the dynamic process of acculturation change and its link to changes in health and other behaviors, research must incorporate prospective study designs. Acculturation is almost always defined as a dynamic process, yet it has rarely been studied in a way that permits the examination of changes over time. Instead, research most commonly uses measures of acculturation assessed at a single point in time to predict cross-sectional or, less commonly, prospective outcomes. While there have been a growing number of articles that examine some aspect of acculturation prospectively in recent years (e.g. Juang & Cookston, 2009; Juang, Syed, & Cookston, 2012; Knight et al., 2009; Lorenzo-Blanco, Unger, Ritt-Olson, Soto, & Baezconde-Garbanati, 2012; Wu & Mak, 2012), most of this research focuses on acculturation within trajectories of change for other key outcomes (e.g. psychological distress, acculturation-based conflict). In a review of the literature, only one study was found that focused on a direct test of whether there were changes in acculturation over time (Miller, Wang, Szalacha, & Sorokin, 2009). Miller and colleagues (2009) found varying levels of change for adult immigrant women from the former Soviet Union across different aspects of acculturation (American behavior, Russian behavior, English language proficiency, and cultural generativity) over a 4-year period. In addition, research indicates that changes may even occur rapidly and persistently through priming procedures and across social contexts (Hong, Morris, Chiu, & Benet-Martínez, 2000; Lechuga, 2008). These important differences in the dynamic processes of acculturation across individuals and contexts have direct implications for how we understand acculturative processes and how they are linked to health.

The current study focuses on acculturation change over time by examining data from a four-year prospective study of Chinese- and Korean-American college students (Authors, 2009), which included primarily first- (Chinese  $n = 85$ , Korean  $n = 87$ ) and second-generation (Chinese  $n = 125$ , Korean  $n = 119$ ) students. The years while in college, typically between ages 18 and 22 years for the students in this study, are formative, with many young adults experiencing challenges to their identities, behaviors, and beliefs. The study uses growth models to examine changes in acculturation scores and health behaviors over the four-year prospective study. We hypothesized that first-generation students would exhibit greater levels of change than second-generation students given second-generation students have had greater exposure to U.S. culture and likely have gone through more of the acculturation process prior to attending college. In addition, with greater exposure to U.S. culture during the years in college we anticipate that first-generation students would endorse increasingly greater U.S. cultural identification over the four years with no differences in acculturation across the Chinese and Korean subgroups. In addition, we examine differences in changes in health behaviors that vary in prevalence across the culture of origin. More specifically, we predict increased alcohol use for Chinese males, Chinese females, and Korean females with greater U.S. acculturation but decreased alcohol use for Korean males with greater U.S. acculturation. While our original intention was to also examine growth models for acculturation and smoking cigarettes, the sample did not have sufficient sample size of smokers to test these models.

## Method

### Sample

A total of 433 participants (224 female, 51.7%) completed the current study, including 223 Chinese- and 210 Korean-American undergraduate students attending a public university in the southwestern U.S. Participants ( $M$  age = 18.2 years,  $SD = 0.32$ ) reported primarily being either first- ( $n = 172$ ; born outside the U.S.) or second-generation ( $n = 244$ ; born in U.S. but either parent born outside U.S.), with equivalent numbers of Chinese (41% first-generation) and Korean (42% first-generation) students by generation. Given the small number of students reporting they were third- generation or higher ( $n = 17$ ), we included only the first- and second-generation students ( $n = 416$ ). The majority of participants ( $n = 305$  participants, 70.4%) reported English was not their first language. Participants were recruited between 2001 and 2003 using campus flyers and newspaper advertisements during their first year of enrollment at the university. Participants were assessed a total of four times, once each year in college, these beginning in 2001 and completed in 2006. Trained research assistants conducted all assessments in English at offices adjacent to the university campus. The first interview occurred during the first half of freshman year in college, the second year interview took place 15 months later (i.e., during the second half of sophomore year), and the final two interviews occurred at 12-month intervals. Nearly all participants lived on campus during their first year (95%), with decreasing numbers over the four years and ending with only 3% living on campus during their fourth year. The majority of participants living off campus reported living in an apartment setting with roommates. The sample was originally recruited to include equivalent numbers for gender and nationality, and enrolled only participants between the ages of 18 and 19. The Institutional Review Board at the

sponsoring institution approved the study and all participants provided informed consent before being included in the study.

## Measures

Demographic variables included in the current analyses include ethnicity, gender, and generational status. The variable capturing years lived in the U.S. is also included for first-generation students. There are four time points of data on the 21-item SL-ASIA (Suinn et al., 1992). The scale provides a 5-point Likert scale in which a score of 1 indicates greater identification with Asian culture (e.g., “prefer to speak Asian only”) and a score of 5 indicates greater identification with U.S. culture (e.g., “prefer to speak English only”). A score of 3 indicates biculturalism (e.g., “prefer to speak Asian and English about equally well”).

Daily alcohol frequency for the past 90-days was assessed at each time point using the Timeline Followback procedure (Sobell & Sobell, 1992), a well-validated approach that employs a calendar to retrospectively record daily use.

## Preliminary Analyses

We examined the SL-ASIA using three different scoring approaches. First, a Confirmatory Factor Analyses (CFA) using WLSMV estimation in MPLUS (Version 5.1) to accommodate categorical, Likert scale data (Flora & Curran, 2004) was run to examine the 5-factor model proposed by Suinn and colleagues (1992) using the year 1 SL-ASIA data. For the current sample, internal reliability for the subscales showed low levels of internal reliability ( $\alpha < 0.7$ ) and the CFA indicated poor model fit (e.g. CFI = .897, RMSEA = .108) with modification indices indicating high cross-loadings for many of the items. Therefore, this approach was discarded.

The second approach was to examine whether participants changed in the type of acculturation orientation they endorsed over the 4 years in university by using a scoring method that recodes items into Asian cultural orientation, U.S. cultural orientation, or a bicultural orientation (Abe-Kim et al., 2001; Magaña et al., 1996). This approach helps to overcome some of the limitations of the unidimensional format of the SL-ASIA. Here, we followed the scoring procedures outlined by Abe-Kim and colleagues, with the category endorsed the most frequently identified as the participants' dominant cultural orientation and if both Asian and U.S. cultures were equally endorsed with each other or with biculturalism responses, then biculturalism was identified as the dominant orientation. Frequencies for each orientation across the four time points were examined across generations.

The third approach was to rationally examine the 21 items of the SL-ASIA (provided in Table 1) to determine whether or not each item addressed attitudes, beliefs or behaviors that could potentially change over time. With the goal of examining the SL-ASIA prospectively, we identified concerns with items on the scale that would confound analyses. For example, generational status and childhood friends (reported in adulthood) represent stable characteristics, and if combined with other items on the scale would attenuate findings. Therefore, we divided the measure into two subscales (Stable and Change) so that we could more accurately assess changes in acculturation over time. However, one item includes



response options representing past and therefore stable characteristics whereas other response options (e.g., visits and communications with individuals living in Asia) potentially change over time. Therefore, this item was dropped from subsequent analyses leaving 4 Stable subscale items and 16 Change subscale items based on the authors' classification. The Change subscale had adequate reliability ( $\alpha = 0.832$ ) while the Stable subscale had lower reliability ( $\alpha = .695$ ), likely influenced by the small number of items. CFA supported adequate fit (RMSEA = .07) for this two-factor solution (Stable and Change) and standardized factor loadings are included in Table 1. We used this scoring method for growth model analyses. Despite the fact we did not anticipate changes in the Stable subscale over time, we included the variable in the growth models as an empirical check of our novel scoring approach.

Participants were assessed annually providing 1,583 assessments, with 79.5% of the sample completing all four assessments, 8.3% completing three assessments, 9.7% completing two assessments, and 2.5% completing one assessment. Chi-square and ANOVA were conducted to compare individuals with missing data and those without. Analyses revealed Korean students were approximately 2 times more likely to have missing data than Chinese students [ $\chi^2(1) = 14.88, p < .001, \eta^2 = .19$ ]. There were no differences in missing data across year 1 acculturation or health behaviors, gender, or generational status. For first-generation students there were no differences across years lived in the U.S. Only complete cases were included in growth models.

In the first set of growth models we examine changes in Stable and Change scores over time using SPSS (version 19). The data were stratified by generational status given we anticipated greater levels of acculturation change among first-generation students than second-generation students. Therefore, the item assessing generational status was dropped from the Stable subscale, leaving three items in that subscale for the growth model analyses ( $\alpha = .637$ ). For first-generation students the analyses included the number of years living in the U.S. as a predictor.

In the second set of growth models we investigate the change in acculturation as a predictor of change in alcohol use for men and women. Growth models were estimated using structural equation modeling techniques and EQS statistical software. A growth model was estimated for change in acculturation across the four time points as well as number of days consuming alcohol in the last 90 days. Changes in alcohol use were predicted from changes in acculturation and ethnicity (Chinese and Korean). Models were estimated separately for men and women. There was evidence that multivariate normality was violated in each group, Mardia's normalized coefficients in the sample of men = 25.01, women = 48.16,  $ps < .001$ . Given the nonnormality, all models were estimated with maximum likelihood (ML) estimation and evaluated with the Satorra-Bentler scaled Chi-square (Satorra & Bentler, 2001).



## Results

### Group Differences

At time 1, using the acculturation orientation classification, the majority of the sample endorsed a dominant bicultural orientation (53%), followed by dominant U.S. orientation (37%) and few endorsing a dominant Asian orientation (10%). Chi-square analyses revealed there were significant differences across generations [ $X^2(2) = 62.26, p < .001, \eta^2 = .15$ ] but no significant differences across gender or ethnicity ( $ps > .35$ ). Table 2 provides cross-tabulations of the frequencies of each cultural orientation for first- and second-generation participants for each year of assessment.

Multivariate Analysis of Variance (MANOVA) and follow-up univariate analyses were conducted to examine group differences in the Stable and Change subscales. These analyses revealed there was a significant difference between first- (M Change = 3.00, SD = 0.43; M Stable = 2.53, SD = 0.75) and second-generation (M Change = 3.32; SD = 0.37; M Stable = 3.52, SD = 0.54) students in their total SL-ASIA Change [ $F(1, 414) = 64.16, p < .001$ ; partial  $\eta^2 = .134$ ] and Stable [ $F(1, 414) = 243.84, p < .001$ ;  $\eta^2 = .371$ ] subscales when comparing the year 1 data. The generational differences accounted for significant differences across the two subscales, which further supported the decision to stratify the data by generational status. MANOVA revealed no significant differences between Chinese and Korean participants (Wilks' Lambda  $F(2) = 1.92, p = .148$ ) or between male and female participants (Wilks' Lambda  $F(2) = 0.24, p = .787$ ). Table 2 provides the mean scores by generation for each of the four years of assessment.

### Growth Model Analyses

To compare first- and second-generation student changes in acculturation, nested growth models were run sequentially with comparisons of model fit at each step in the analysis to determine the best fitting model. Models were run first testing the effects of time (linear and quadratic with fixed and random effects each entered separately). Next, additional main effects were entered followed by interaction terms in the final model for first-generation analyses. Based on Chi-squared difference tests, the final models were selected as the best fitting model for first- and second-generation students separately.

**First-generation students: Change subscale**—In the final model (AIC = 3463.482), the linear slope ( $b = 0.252, p < .001$ ) but not quadratic slope ( $b = -0.165, p = .141$ ) significantly predicted the Change subscale. There was also a significant effect for how long first-generation students had lived in the U.S. ( $b = 0.831, p < .001$ ). The longer first-generation students lived in the U.S. the more they identified with U.S. culture. There was significant variance in the intercept (Wald  $Z = 24.769, p < .001$ ), linear slope (Wald  $Z = 3.542, p < .001$ ), and quadratic slope (Wald  $Z = 2.227, p = .026$ ). Participants had different initial levels of acculturation, and the rate at which their acculturation changed also varied significantly.

**First-generation students: Stable subscale**—In the final model (AIC = 2108.68) the linear slope ( $b = 0.040, p = .015$ ) but not quadratic slope ( $b = -0.070, p = .109$ ) was

significant in predicting the Stable subscale. The significant linear change in slope for the Stable subscale is inconsistent with the study hypothesis. There was a significant effect for how long first-generation students had lived in the U.S. ( $b = 0.397, p < .001$ ). The longer first-generation students lived in the U.S. the greater their acculturation toward U.S. culture. There was significant variance in the intercept (Wald  $Z = 8.104, p < .001$ ) and quadratic slope (Wald  $Z = 2.359, p = .018$ ). The random effects for the linear slope were not tested in the final model, as it had not significantly improved model fit in the earlier testing of the model. Models including interactions between the linear and quadratic time variables and years in the U.S. were also tested but did not significantly improve the model.

**Second-generation students: Change subscale**—In the final model there was no linear or quadratic change over time, (AIC = 4863.388), neither the linear ( $b = 0.096, p = .066$ ) nor quadratic ( $b = 0.068, p = .449$ ) time variables were significant. There was significant variance in the intercept (Wald  $Z = 10.313, p < .001$ ), which indicated participants varied in their initial level of acculturation. Although there was no significant overall linear or quadratic slope there was variability associated with both the linear slope coefficient (Wald  $Z = 5.684, p < .001$ ), and quadratic slope coefficient (Wald  $Z = 3.091, p = .001$ ). These significant variances highlight that individuals varied in degree of acculturation change when compared to the overall linear and quadratic slopes.

**Second-generation students: Stable subscale**—In the final model (AIC = 2723.33), neither the linear slope ( $b = -0.014, p = 0.323$ ) nor quadratic slope ( $b = -0.024, p = 0.373$ ) time variables significantly predicted the Stable subscale. There was significant variance in the intercept (Wald  $Z = 1.913, p < .001$ ) and linear slope (Wald  $Z = 2.757, p < .01$ ), but not the quadratic slope (Wald  $Z = 1.142, p = .254$ ). These significant variances highlight the significant individual variability in initial level of acculturation and in the linear but not quadratic slopes.

**Growth models for acculturation and health behaviors stratified by gender**—There was evidence that the model fit well for both women and men: women, Satorra-Bentler  $\chi^2 (N=154, 28) = 34.02, p=.20, CFI = .99, RMSEA = .04$ ; men, Satorra-Bentler  $\chi^2 (N=257, 123) = 32.04, p=.31, CFI = .99, RMSEA = .04$ . Over the course of the study period, women's acculturation increased, ( $b = .32, p < .05$ ), as did their alcohol use ( $b = 1.98, p < .05$ ). Level of acculturation predicted alcohol use, ( $b = -.59, p < .05$ ), as women became more acculturated they reported using less alcohol. Ethnicity predicted neither the growth curve for change in acculturation nor alcohol use  $ps > .05$ .

For men, acculturation did not change significantly over the course of the study period ( $b = .25, p = .08$ ); however, their alcohol use did increase significantly ( $b = 5.08, p < .05$ ). Level of acculturation did not predicted alcohol use, ( $b = -.96, p > .05$ ). However ethnicity did significantly predict alcohol use Chinese men rate of increase in drinking was greater than Korean men ( $b = -1.78, p < .05$ ). Table 3 provides mean acculturation and alcohol scores stratified by gender and ethnicity at each time point.

## Discussion

The rapidly growing numbers of immigrants worldwide necessitate the advancement of understanding and measurement of acculturation as a dynamic process and, in turn, promoting the quality of health interventions available for immigrants and diverse populations. The results from this study highlight the importance of examining changes in acculturation over time and underscore a theoretically and logically assumed, but rarely evaluated, notion that acculturation is dynamic. There were differences across generations, gender, and Chinese and Korean students in the patterns of change in acculturation and health behaviors over the study period that were not captured when making baseline, cross-sectional comparisons. These findings provide support for the importance of examining acculturation and its impact on health behaviors through prospective study designs.

First-generation students demonstrated greater changes in acculturation over the four years than second-generation students. At the onset of the study first-generation participants were near the midpoint on the scale (i.e. biculturalism via the original scoring and cultural orientation scoring methods) with movement toward more monocultural American orientation by the end of the four-year study on the behavior-focused SL-ASIA measure of acculturation for both scoring methods. Surprisingly, there was significant linear change for first-generation students on the Stable subscale, which contradicted study hypotheses. This finding may be due to recall biases introduced as individuals progress toward greater American orientation, with people reporting different childhood and adolescent friends based on the cultural background of their current friends and personal acculturation level. While there may be other factors causing this inconsistency, the unexpected result underscores the importance of examining acculturation processes in real-time due to limitations in retrospective recall. While second-generation students had higher levels of monocultural American orientation at the onset of the study, there was no significant change in either the Change or Stable subscales nor in their dominant cultural orientation over the four-year period. These findings highlight that change may be most relevant to first-generation migrants and that there are aspects of acculturation that may be more or less dynamic over time.

While baseline comparisons of gender and ethnicity were not significant, there were gender and ethnic differences in acculturation and health behavior change over the study period. While alcohol consumption increased for all groups, the degree of change and its link to acculturation varied across subgroups, which supports the notion that the acculturation process may serve as a risk, protective, or neutral factor depending on the person and the old/new cultural norms. As women became more acculturated to U.S. culture they reported using less alcohol, with no differences across Chinese and Korean women. This was opposite our hypothesis and future research would benefit from further extrapolating the link between acculturation and alcohol consumption using a bidimensional measure of acculturation and in other contexts. For men, there was no association between alcohol consumption and acculturation, but Chinese men had greater increases in alcohol consumption than did Korean men. While we hypothesized that Chinese men would have greater increases in alcohol consumption than Korean men, we hypothesized that Korean men would have greater alcohol consumption overall, which was not the case. This finding

may be unique to the environment where the study was conducted and comparisons across other settings are warranted.

The results should inform acculturation scale development. Psychometrics and scale development have strong foundations in which more stable items are preferred and/or retained (e.g., test-rest reliability), and therefore items are less likely to detect change. This has been a confounding issue in other areas of research where assessment of change likely underestimates actual changes (Mroczek & Spiro, 2003). Therefore, current acculturation measures and assessment of change using those measures (when it is done) likely underestimate real-life changes in cultural attitudes, beliefs, and behaviors. Moreover, our current measures, as demonstrated here, frequently combine both stable and dynamic aspects of acculturation that can confound examinations of change over time. Future studies would benefit from developing scales and items that better differentiate these characteristics and follow participants over time so as to link specific acculturative changes, such as dietary habits or attitudes toward smoking, to the health topic or other outcome (e.g. economic self-sufficiency, mental health) of interest.

Adequate conceptualization and measurement of acculturation is important for many reasons, including the appropriate adaptation and effective implementation of health programs. Information on behavioral and cognitive preferences among immigrants can help health programs and providers to better target and tailor messages for their intended audience. It is also essential for examining the effectiveness of evidenced-based programs for implementation with diverse cultural groups across a range of acculturation (Castro, Barrera, & Holleran Steiker, 2010). Moreover, information on acculturation over time will clarify how quickly health behaviors change following migration and help to identify optimal time periods for intervention.

### Limitations

While the current analyses provide meaningful first steps to address issues of change in acculturation, there are several limitations. Despite criticisms of unidimensional scales such as the SL-ASIA (e.g. Ryder, Alden, & Paulhus, 2000), it is still a widely reported scale in the literature (e.g. Ayres & Mahat, 2012; Dao, Teten, & Nguyen, 2010; Venkatesh, Weatherspoon, Kaplowitz & Song, 2013) and the types of questions included in the measure are paralleled in many other scales. In these analyses we used two different scoring methods to overcome some of the limitations of the unidimensional approach; however, additional prospective investigations that permit a more thorough examination of uni- and multidimensional approaches are needed. Miller and colleagues (2009) found linear increases in American behaviors but curvilinear decreases in Russian behaviors in their longitudinal study of immigrant women from the former Soviet Union. However, this is the only study to our knowledge specifically assessing changes in acculturation. Future studies would benefit from using scales that compare unidimensional and bidimensional measures of acculturation in order to distinguish differential changes in cultural identification and practices over time.

In addition, the years while attending college represent a dynamic time period for many young adults. The current analyses provide some information on change that occurs within

two groups of Asian Americans; however, this may or may not generalize to other groups of immigrants, other settings, or different time-periods over the life course. Even the first-generation participants in this study had lived in the U.S. for most of their lives ( $M$  years in the U.S. = 10.46,  $SD$  = 4.46 and  $M$  age = 18.1 years). Therefore, less change in some dimensions and potentially greater change in other dimensions would be expected than in more recent immigrants as well as among adult immigrants across the lifespan. Additional studies that examine changes in acculturation over the lifespan among other groups of adult immigrants, representing a wider range of time since immigration, are needed to better understand the context of acculturation and its processes with diverse groups in diverse settings.

Finally, Korean students were two times more likely to have missing data than Chinese students despite no significant differences on other baseline characteristics (e.g. acculturation or alcohol consumption) we hypothesized might influence missing data. In this sample, many students had missing assessments when studying abroad and it is possible that Korean students were more likely to study abroad; however, information is not available to test this hypothesis. It is also possible that there may be acculturation factors that influence the extent to which diverse communities engage with the research process and further exploration of these possibilities is needed.

### Future Directions

Acculturation is a complex and challenging construct to assess. The focus here is on the importance of incorporating prospective research designs that allow us to look at within and between person changes and link acculturation processes to changes in health behaviors. The field would benefit from increased use of longitudinal and experience sampling methods to examine how the dynamic process of acculturation unfolds over time and in real-time experiences. Studies of these dynamic processes might be most useful during the time period immediately following migration as an important time of transition and change. These approaches provide the opportunity to examine individual differences in intra-individual change to better address questions that have been assessed largely through cross-sectional data thus far. Other areas of research have laid a meaningful framework of methods and measures for acculturation researchers to follow.

The differences in acculturation across generational status, years living in the U.S., gender, and ethnicity have direct implications for working with diverse populations in a variety of settings. Programs should be tailored based on where immigrants are in the acculturation process and life course (Nguyen & Lee, 2012). For example, undergraduate health promotion programs should target the unique barriers and motivations to engaging in health behaviors, such as willingness to seek services (Zhang & Dixon, 2003), which vary as a function of acculturation and ethnicity. Moreover, they should aim to maintain healthy behaviors from the culture of origin and prevent unhealthy behaviors from the new host culture early in the acculturation process when changes are most evident. In this way, researchers and practitioners are implementing true prevention programs that promote health and wellbeing before the onset of pathologies. With more research that examines acculturation over time, tailored programs could be even more precise and effective.

Another important area for examination involves development and selection of items to be included in acculturation measures. When using an acculturation measure in cross-sectional research, subscales that are more stable (e.g., generational status) may be more appropriate to include if hypothesized to relate to the study outcomes of interest. However, as demonstrated here, some items and subscales change over time and with exposure to the new culture. This leaves open to question whether these items should be included in acculturation scales or whether acculturation should be measured in two ways: one approach and set of items for cross-sectional research and another for longitudinal. If the goal of acculturation research is to capture changes over time as a function of interacting with the mainstream culture, then current acculturation measures may need to be reconstituted to include only items that we would expect to change when coming in contact with a new culture.

The current study assessed changes over a four-year period, which coincided with their time in college, an anticipated dynamic developmental period for young adults. However, it remains to be seen whether there are other developmental periods following migration that are more or less dynamic, for certain groups, in regard to specific dimensions of acculturation that might provide better indications or points of intervention for key health outcomes. Longitudinal and dynamic approaches that incorporate measures that allow us to answer the aforementioned questions are essential for advancing our understanding of acculturation and, in turn, promoting health and optimal adaptation among all immigrants with the understanding that this may include fostering the maintenance of behaviors from one's culture of origin or the adoption of new health behaviors.

## Acknowledgments

We would like to acknowledge Manuel Barerra, Jr. and anonymous reviewers for their insightful comments on earlier versions of the manuscript. This research was supported by grants from the California Tobacco Related Disease Research Program (grant numbers 10RT-0142, 12RT-0004); National Institute on Drug Abuses (grant numbers, K02 DA17652, DA 01070-38); National Institute on Alcohol Abuse and Alcoholism (grant number K02 AA00269); and the National Cancer Institute Minority Institution/Cancer Center Partnership Program (grant numbers U54CA132384, U54CA132379).

## References

- Abe-Kim J, Okazaki S, Goto SG. Unidimensional verses multidimensional approaches to the assessment of acculturation for Asian American populations. *Cultural Diversity and Ethnic Minority Psychology*. 2001; 7:232–246. [PubMed: 11506070]
- American College Health Association. American College Health Association-National College Health Assessment II: Reference Group Executive Summary. 2011. Retrieved from the American College Health Association website [http://www.acha-ncha.org/docs/ACHA-NCHA-II\\_ReferenceGroup\\_ExecutiveSummary\\_Spring2011.pdf](http://www.acha-ncha.org/docs/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Spring2011.pdf)
- Authors. Psychosocial, cultural and genetic influences on alcohol in Asian-American youth. *Journal of Studies on Alcohol*. 2005; 66:205–212. [PubMed: 15957671]
- Authors. A prospective study of cigarette smoking initiation during college: Chinese and Korean American students. *Health Psychology*. 2009; 28:448–456. [PubMed: 19594269]
- Ayres CG, Mahat G. Social support, acculturation, and optimism: Understanding positive health practices in Asian American college students. *Journal of Transcultural Nursing*. 2012; 23:270–278. [PubMed: 22491301]
- Berry JW, Sabatier C. Variations in the assessment of acculturation attitudes: Their relationships with psychological wellbeing. *International Journal of Intercultural Relations*. 2011; 35:658–69.



- Bond, MH.; Hwang, KK. The social psychology of Chinese people. In: M, H., editor. The psychology of Chinese people. Hong Kong: Oxford University Press; 1986. p. 213-266.
- Britz, E.; Batalova, J. Frequently requested statistics on immigrants and immigration in the United States. Washington, D.C.: Migration Policy Institute; 2013.
- Castro FG, Barrera M Jr, Holleran Steiker LK. Issues and challenges in the design of culturally adapted evidence-based interventions. *Annual Review of Clinical Psychology*. 2010; 6:213–239.
- Castro, FG.; Murray, KE. Cultural adaptation and resilience in migrant populations: Controversies, issues and emerging models. In: Reich, JW.; Zautra, AJ.; Hall, JS., editors. *Handbook of adult resilience: Concepts, methods, and applications*. New York: Guilford; 2009. p. 375-403.
- Cheng, TK. *The world of the Chinese: The struggle for human unity*. Hong Kong: Chinese University Press; 1980.
- Chirkov V. Critical psychology of acculturation: What do we study and how do we study it, when we investigate acculturation? *International Journal of Intercultural Relations*. 2009; 33:94–105.
- Cho YI, Faulkner WR. Conceptions of alcoholism among Koreans and Americans. *The International Journal of the Addictions*. 1993; 28:681–694. [PubMed: 8349386]
- Dao TK, Teten AL, Nguyen Q. Linear and orthogonal models of acculturation and its relations to cultural variables: An examination of the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA). *International Journal of Intercultural Relations*. 2011; 35:61–68.
- Flora DB, Curan PJ. An empirical evaluation of alternative methods of estimation for Confirmatory Factor Analysis with ordinal data. *Psychological Methods*. 2004; 9:466–491. [PubMed: 15598100]
- Hahm HC, Lahiff M, Guterman NB. Acculturation and parental attachment in Asian-American adolescents' alcohol use. *Journal of Adolescent Health*. 2003; 33:119–129. [PubMed: 12890603]
- Hahm HC, Lahiff M, Guterman NB. Asian American Adolescents' Acculturation, Binge Drinking, and Alcohol- and Tobacco-Using Peers. *Journal of Community Psychology*. 2004; 32:295–308.
- Higuchi S, Matsushita S, Muramatsu T, Murayama M, Hayashida M. Alcohol and aldehyde dehydrogenase genotypes and drinking behavior in Japanese. *Alcoholism: Clinical and Experimental Research*. 1996; 20:493–497.
- Hong Y, Morris MW, Chiu C, Benet-Martínez V. Multicultural minds: A dynamic constructivist approach to culture and cognition. *American Psychologist*. 2000; 55:709–720. [PubMed: 10916861]
- Hunt LM, Schneider S, Comer B. Should “acculturation” be a variable in health research? A critical review of research on US Hispanics. *Social Science & Medicine*. 2004; 59:973–986. [PubMed: 15186898]
- Hussar, WJ.; Bailey, TM. Projections of Education Statistics to 2018. 2009. Retrieved from US Department of Education National Center for Education Statistics website <http://nces.edu.gov/pubs2009/2009062.pdf>
- International Organization for Migration. Facts and Figures: Global Estimates and Trends. Washington, D.C.: Author; 2011. Retrieved from <http://www.iom.int/jahia/Jahia/about-migration/facts-and-figures/lang/en>
- Juang LP, Cookston JT. Acculturation, discrimination, and depressive symptoms among Chinese American adolescents: A longitudinal study. *Journal of Primary Prevention*. 2009; 30:475–496. [PubMed: 19381814]
- Juang LP, Syed M, Cookston JT. Acculturation-based and everyday parent-adolescent conflict among Chinese American adolescents: Longitudinal trajectories and implications for mental health. *Journal of Family Psychology*. 2012; 26:916–926. [PubMed: 23088797]
- Knight GP, Vargas-Chanes D, Losoya SH, Cota-Robles S, Chassin L, Lee JM. Acculturation and Enculturation Trajectories Among Mexican-American Adolescent Offenders. *Journal of Research on Adolescence*. 2009; 19:625–653. [PubMed: 20300539]
- Kwan MY, Cairney J, Faulkner GE, Pullenayegum EE. Physical activity and other health-risk behaviors during the transition into early adulthood: A longitudinal cohort study. *American Journal of Preventive Medicine*. 2012; 42:14–20. [PubMed: 22176841]
- Lara, M.; Gamboa, C.; Kahramanian, MI.; Morales, LS.; Bautista, DEH. Acculturation and Latino health in the United States: A review of the literature and its sociopolitical context. In: LaVeist,



- TA.; Isaac, LA., editors. *Race, Ethnicity, and Health: A public health reader*. San Francisco: Jossey-Bass; 2012. p. 215-252.
- Lechuga J. Is acculturation a dynamic construct?: The influence of method of priming culture on acculturation. *Hispanic Journal of Behavioral Sciences*. 2008; 30:324–339.
- Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L. A longitudinal analysis of Hispanic youth acculturation and cigarette smoking: The roles of gender, culture, family, and discrimination. *Nicotine & Tobacco Research*. 2013; 15:957–68. [PubMed: 23109671]
- Magaña JR, de la Rocha O, Amsel J, Magaña HA, Fernandez MI, Rulnick S. Revisiting the dimensions of acculturation: Cultural theory and psychometric practice. *Hispanic Journal of Behavioral Science*. 1996; 18:444–468.
- Matsudaira T. Measures of psychological acculturation: A review. *Transcultural Psychiatry*. 2006; 43:462–487. [PubMed: 17090628]
- Miller AM, Wang E, Szalacha LA, Sorokin O. Longitudinal changes in acculturation for immigrant women from the former Soviet Union. *Journal of Cross-Cultural Psychology*. 2009; 40:400–415. [PubMed: 22180661]
- Mroczek DK, Spiro A. Modeling intraindividual change in personality traits: Findings from the Normative Aging Study. *Journal of Gerontology*. 2003; 58B:P153–P165.
- Nguyen D, Lee R. Asian immigrants' mental health service use: An application of the life course perspective. *Asian American Journal of Psychology*. 2012; 3:53–63.
- Park JY, Danko GP, Wong SYC, Weatherspoon AJ, Johnson RC. Religious affiliation, religious involvement, and alcohol use in Korea. *Cultural Diversity and Mental Health*. 1998; 4:291–296. [PubMed: 9818517]
- Park SC, Oh SI, Lee MS. Korean status of alcoholics and alcohol-related health problems. *Alcoholism: Clinical and Experimental Research*. 1998; 22:170S–172S.
- Pedersen PB. Culture-centered counseling skills as a preventive strategy for college health services. *Journal of American College Health*. 1995; 44:20–26. [PubMed: 7673583]
- Pew Social & Demographic Trends. *The rise of Asian Americans*. Washington, D.C.: Pew Research Center; 2012. Retrieved from [http://www.pewsocialtrends.org/files/2013/01/SDT\\_Rise\\_of\\_Asian\\_Americans.pdf](http://www.pewsocialtrends.org/files/2013/01/SDT_Rise_of_Asian_Americans.pdf)
- Phinney J, Alipuria L. Ethnic identity in college students from four ethnic groups. *Journal of Adolescence*. 1990; 13:171–184. [PubMed: 2387919]
- Rudmin F. Constructs, measurements and models of acculturation and acculturative stress. *International Journal of Intercultural Relations*. 2009; 33:106–123.
- Ryder AG, Alden LE, Paulhus DL. Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *Journal of Personality and Social Psychology*. 2000; 79:49–65. [PubMed: 10909877]
- Schwartz SJ, Unger JB, Zamboanga BL, Szapocznik J. Rethinking the concept of acculturation: Implications for theory and research. *American Psychologist*. 2010; 65:237–51. [PubMed: 20455618]
- Sobell, L.; Sobell, M. Time-line follow-back: A technique for assessing self-reported alcohol consumption. In: Litten, R.; Allen, J., editors. *Measuring alcohol consumption: Psychosocial and biochemical methods*. Totowa, NJ: Pergamon Press; 1992. p. 73-98.
- Sue S, Zane N, Ito J. Alcohol drinking patterns among Asian and Caucasian Americans. *Journal of Cross-Cultural Psychology*. 1979; 10:41–56.
- Suinn RM. Reviewing acculturation and Asian Americans: How acculturation affects health, adjustment, school achievement, and counseling. *Asian American Journal of Psychology*. 2010; 1:5–17.
- Suinn RM, Ahuna C, Khoo G. The Suinn-Lew Asian Self-Identity Acculturation Scale: Concurrent and factorial validation. *Educational and Psychological Measurement*. 1992; 52:1041–1046.
- Tabachnick, BG.; Fidell, LS. *Understanding Multivariate Statistics*. 5th. Boston: Allyn & Bacon; 2007.
- Tang H, Shimizu R, Chen MS. English language proficiency and smoking prevalence among California's Asian Americans. *Cancer*. 2005; 104(S12):2982–2988. [PubMed: 16276539]

- Venkatesh S, Weatherspoon LJ, Kaplowitz SA, Song WO. Acculturation and glycemic control of Asian Indian adults with type 2 diabetes. *Journal of Community Health*. 2013; 38:78–85. [PubMed: 22744164]
- Wechsler H, Dowdall GW, Davenport A, Rimm EB. A gender-specific measure of binge drinking among college students. *American Journal of Public Health*. 1995; 85:982–985. [PubMed: 7604925]
- Wu EKY, Mak WWS. Acculturation process and distress: Mediating roles of sociocultural adaptation and acculturative stress. *The Counseling Psychologist*. 2012; 40:66–92.
- Zhang N, Dixon DN. Acculturation and attitudes of Asian international students toward seeking psychological help. *Journal of Multicultural Counseling and Development*. 2003; 31:205–222.

**Table 1**  
**SL-ASIA items classified under the Change and Stable subscales with standardized factor loadings\***

Factor Loading	Change Subscale ( $\alpha = .832^{\#}$ )
0.70	1. What language can you speak?
0.78	2. What language do you prefer?
0.37	3. How do you identify yourself?
0.29	4. Which identification does (did) your mother use?
0.30	5. Which identification does (did) your father use?
0.25	8. Whom do you now associate with in the community?
0.32	9. If you could pick, whom would you prefer to associate with in the community?
0.68	10. What is your music preference?
0.48	11. What is your movie preference?
0.40	15. What is your food preference at home?
0.24	16. What is your food preference at restaurants?
0.69	17. Do you read only Asian/English language [better than/only]?
0.65	18. Do you write only Asian/English language [better than/only]?
0.34	19. If you consider yourself a member of the Asian group (whatever term you prefer), how much pride do you have in this group?
0.67	20. How would you rate yourself [Very Asian to Very Westernized]?
0.31	21. Do you participate in Asian occasions, holidays, traditions, etc.?
	<b>Stable Subscale (<math>\alpha = .695^{\#}</math>)</b>
0.71	6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?
0.40	7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?
0.58	12. What generation are you?
0.76	13. Where were you raised?

\* 5-point Likert scale: 1 = greater identification with Asian culture (e.g., "prefer to speak Asian only") to 5 = greater identification with U.S. culture (e.g., "prefer to speak English only"). A score of 3 indicates biculturalism (e.g., "prefer to speak Asian and English about equally well").

<sup>#</sup> Cronbach's alpha ( $\alpha$ ) were calculated using Year 1 data only

Note. Item 14, "What contact have you had with Asia?" was dropped given response options included answers that may or may not change over time. The Change and Stable subscales were correlated,  $r = 0.29$ .

**Table 2**  
**Mean Change and Stable subscale scores by generation over the 4 years of assessment**

<b>Cultural orientation</b>	<b>Year 1 n (%)</b>	<b>Year 2 n (%)</b>	<b>Year 3 n (%)</b>	<b>Year 4 n (%)</b>
<b>1<sup>st</sup> Generation</b>				
Asian	35 (20%)	26 (15%)	15 (10%)	22 (15%)
Bicultural	107 (63%)	106 (62%)	92 (64%)	89 (59%)
U.S.	30 (17%)	39 (23%)	37 (26%)	41 (27%)
<b>2<sup>nd</sup> Generation</b>				
Asian	8 (3%)	8 (3%)	7 (3%)	6 (3%)
Bicultural	114 (47%)	108 (46%)	90 (44%)	91 (46%)
U.S.	122 (50%)	117 (50%)	110 (53%)	100 (51%)
<b>Change Subscale**</b>				
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Total Change subscale	3.18 (0.43)	3.21 (0.40)	3.24 (0.39)	3.26 (0.39)
1 <sup>st</sup> Generation	3.00 (0.43)	3.06 (0.43)	3.11 (0.40)	3.06 (0.40)
2 <sup>nd</sup> Generation	3.32 (0.37)	3.32 (0.34)	3.33 (0.36)	3.36 (0.34)
<b>Stable Subscale**</b>				
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Total Stable Subscale	3.11 (0.80)	3.14 (0.80)	3.18 (0.79)	3.12 (0.78)
1 <sup>st</sup> Generation	2.53 (0.75)	2.62 (0.83)	2.68 (0.82)	2.64 (0.88)
2 <sup>nd</sup> Generation	3.52 (0.54)	3.52 (0.51)	3.52 (0.54)	3.48 (0.56)

Notes.

\*\* Significant difference between 1<sup>st</sup> and 2<sup>nd</sup> generation scores on the Change and Stable subscales,  $p < .001$ .

**Table 3**  
**Mean Change scores and alcohol use by gender and ethnicity over the 4 years of assessment**

	Year 1 <i>M (SD)</i>	Year 2 <i>M (SD)</i>	Year 3 <i>M (SD)</i>	Year 4 <i>M (SD)</i>
Men				
Chinese Acculturation	51.90 (7.01)	51.58 (6.55)	51.62 (6.86)	52.13 (6.56)
Alcohol	4.28 (5.31)	6.36 (9.24)	9.16 (12.71)	11.52 (16.01)
Korean Acculturation	50.20 (7.33)	50.34 (6.60)	51.70 (6.36)	51.70 (6.69)
Alcohol	4.88 (6.33)	4.91 (7.90)	6.71 (9.42)	8.14 (8.78)
Women				
Chinese Acculturation	51.38 (6.60)	51.74 (6.42)	52.59 (6.13)	52.27 (5.73)
Alcohol	3.76 (5.89)	5.17 (6.65)	8.29 (12.78)	8.60 (8.73)
Korean Acculturation	50.44 (6.32)	51.36 (6.24)	51.36 (5.50)	52.15 (5.86)
Alcohol	4.59 (9.36)	6.98 (12.26)	8.45 (10.39)	8.57 (8.96)

Notes. Acculturation refers to scores on the Change subscale. Alcohol refers to self-report scores of days consuming alcohol in the past 90 days.