Latent Profiles of Acculturation and Their Implications for Health: A Study With Asian Americans in Central Texas

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Abstract

The present study identified profiles of acculturation in Asian Americans and explored their implications for health. Pointing out the upward selection bias of Asian Americans in English-only surveys, the study calls attention to the importance of obtaining Asian American samples that reflect the group's cultural and linguistic diversities. Data were drawn from 2,602 participants (age range = 18–98) in the 2015 Asian American Quality of Life (AAQoL) Survey, conducted in central Texas. To reach out to diverse groups of Asian Americans, culturally and linguistically sensitive approaches (e.g., survey questionnaire in Asian languages, bilingual/bicultural recruiters and survey assistants, and partnerships with key individuals and organizations within ethnic communities) were employed, resulting in a sample almost half of which were surveyed in their native languages. Latent profile analysis based on acculturation-related variables (nativity, proportion of life lived in the United States, English speaking ability, familiarity with host culture, familiarity with heritage culture, identity toward ethnic origin, and sense of belonging to the community of ethnic origin) identified a 4-cluster solution: fully bicultural, moderately bicultural, alienated from host culture, and alienated from heritage culture. The fully bicultural group was most advantaged in terms of self-ratings of physical, oral, and mental health. The alienated from heritage culture group demonstrated a particular risk for physical and mental health, whereas the alienated from host culture group was at risk for oral health. Findings not only help understand the heterogeneity of acculturation in Asian Americans but also provide implications for health interventions.

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Keywords

acculturation; health; Asian Americans

Acculturation, the process of cultural adaptation that takes place when an individual had a prolonged exposure to a new culture, is an essential element in understanding the unique experiences of ethnic and cultural minorities (Berry, 1992, 1997; Sam & Berry, 2016). Studies have shown the value of acculturation as a proxy for socioeconomic status, marker of successful adaptation, enabler of health and social service use, and determinant of health and well-being (Berry, Phinney, Sam, & Vedder, 2006; Chun, Balls Organista, & Martin, 2003; Sam & Berry, 2016). Prompted by the growth of immigrant populations and the increasing awareness and appreciation for cultural diversity in the United States and worldwide, a sizable body of literature has accumulated on the topic of acculturation over the past few decades (Berry et al., 2006; Chun et al., 2003; Sam & Berry, 2016). However, relatively little attention has been paid to the Asian American population (Trinh-Shevrin, Islam, & Rey, 2009; Yoo, Le, & Oda, 2012).

As a broad racial/ethnic category, Asian Americans are the fastest growing minority group in the United States (Pew Research Center, 2013; U.S. Census Bureau, 2012). The 45.6% growth rate for Asian Americans from 2000 to 2010 is phenomenal, given that the corresponding figure for the U.S. total population is only 9.7% (U.S. Census Bureau, 2012). Yet despite their rapid population growth, acculturation in Asian Americans remain poorly understood (Trinh-Shevrin et al., 2009; Yoo et al., 2012). Much of the knowledge on Asian Americans is drawn from small samples of convenience, which are limited in generalizability. There are few national or state-wide surveys that include Asian American participants; however, their representativeness is also of question because those surveys generally include only those who speak English (Jang, Yoon, Park, & Chiriboga, 2016). Considering that a substantial proportion of the Asian American population is foreign-born immigrants with limited English proficiency (Pew Research Center, 2013), the issues of acculturation in this emerging population should be addressed using a sample that reflects their cultural and linguistic diversities.

Models of Acculturation

Despite the long history of the acculturation research, there is an ongoing debate on the theoretical conceptualization and measurement of acculturation (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). One target of debate is the original conceptualization of acculturation as a linear continuum in which endorsement of one culture implies relinquishment of the other (Gordon, 1964). Subsequent bidimensional approaches generally treat the acquisition of host culture and the retention of heritage culture as independent constructs. For example, Berry's (1992, 1997) four-cell typology of acculturation (integration, assimilation, separation, and marginalization) is based upon the differing levels of engagement with host country and the country-of-origin. *Integration* occurs when individuals maintain a positive relation to a new culture as well as to their original culture; *assimilation* refers to the relinquishment of original cultural identity and complete

absorption in a new culture; *separation* occurs when individuals retain their original culture while rejecting the new culture; and *marginalization* involves nonalignment with either culture. Berry's model has been widely used and made an important contribution to understanding the process of cultural adaptation in diverse groups of ethnic and cultural minorities (Schwartz & Zamboanga, 2008).

Ways to Identify Acculturation Groups

Earlier studies following Berry's bidimensional approach often used mean or median splits to create 2 × 2 classifications (e.g., Marin & Gamba, 1996; Ying, 1995). The practice has been criticized for its lack of consideration of group saliency and use of arbitrary cut points (Schwartz & Zamboanga, 2008). Given the differences in the nature and history of immigration and settlement across the groups, the universal existence and equal validity of the four typologies cannot be assumed. For example, the assimilation and marginalization cells, both of which require minimal or no allegiance to heritage culture, were nonexistent in one study of elderly Korean Americans, who are predominantly foreign-born first-generation immigrants (Jang, Kim, Chiriboga, & Kallimanis, 2007). With respect to the reliance upon arbitrary cut points, some researchers have used cluster analytic approaches to derive subgroups that are sample-specific and person-centered (e.g., Chia & Costigan, 2006; Jang et al., 2007; Lee, Sobal, & Frongillo, 2003). This cluster approach has been advanced by the use of latent modeling, which offers a systematic way of addressing the heterogeneity of acculturation by identifying groups of individuals who share a latent profile (e.g., Nieri, Lee, Kulis, & Marsiglia, 2011; Salas-Wright, Clark, Vaughn, & Cordova, 2015; Schwartz & Zamboanga, 2008).

In general, studies using latent modeling provide some empirical support for Berry's typologies (Schwartz et al., 2010); however, a great deal of variability has been observed in diverse samples, and this variability offers opportunities to expand our understanding of acculturation. For example, the six latent clusters identified by Schwartz and Zamboanga (2008) in their sample of Hispanic young adults not only included three clusters that closely reflect Berry's original typologies (integration, assimilation, and separation), but two subtypes of integration and a new cluster of undifferentiated individuals also emerged. Other studies also demonstrated variants of Berry's original typology that differentiated according to the degree of affinity to or alienation from host/heritage cultures (e.g., Nieri et al., 2011; Salas-Wright, Clark et al., 2015).

With regard to Asian Americans, the application of the latent class/profile approach to extracting acculturation typologies is rare. One exception is a study of over 900 Asian/ Pacific Islanders from the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), where a latent profiling based on language ability and preference, cultural identification, and social engagement yielded five clusters, described as separated, partial bilingual/bicultural, English dominant/Asian oriented, full bilingual/bicultural, and assimilated (Salas-Wright, Lee, Vaughn, Jang, & Sanglang, 2015). Although the study made an important contribution to the field, generalization of findings to the larger Asian population is not warranted because all interviews in the NESARC were conducted in

English. The systematic exclusion of non-English speaking persons could result in misrepresentation of Asian Americans.

The Present Study

Responding to the paucity of research using latent profiling of acculturation and the upward selection bias in Asian Americans (Jang et al., 2016; Salas-Wright, Lee et al., 2015), the present study revisited the issues on acculturation using a sample that reflects the target group's cultural and linguistic diversities. The primary focus of the present study was to derive latent profiles of acculturation. Based on the review of literature on latent models of acculturation (e.g., Nieri et al., 2011; Salas-Wright, Clark, et al., 2015; Salas-Wright, Lee, et al., 2015; Schwartz & Zamboanga, 2008; Schwartz et al., 2010) and data availability, seven variables (nativity, proportion of life lived in the United States, English speaking ability, familiarity with host culture, familiarity with heritage culture, identity toward ethnic origin, and sense of belonging to the community of ethnic origin) were selected as a criterion to be used in latent modeling. We also examined the association of the identified acculturation profiles with a brief measure of health as a way to explore their implications for health. To capture a broad range of health, we included three indicators of health: (a) self-rated health, (b) self-rated oral health, and (c) self-rated mental health. Because of the unique feature of the study and the absence of related literature, the present investigation was explorative in its nature. Findings would not only help understand the heterogeneity of acculturation in Asian Americans but also provide implications for health interventions.

Method

Sample

Data were driven from the 2015 AAQoL survey. The survey is part of the City of Austin's AAQoL initiative, which was conducted in response to the rapid growth of the Asian American population in the area. Currently, an estimated 110,000 to 115,000 Asians live in metropolitan Austin, and the size of the Asian community has been doubled every 12 years (City of Austin, 2017). The AAQoL survey was conducted with self-identified Asian Americans aged 18 and older living in the Austin area. Although the survey primarily used the convenience sampling approach, special efforts were made to mirror the ethnic composition of the Asian population in the area. The U.S. Census identifies Asian Indian, Chinese, Vietnamese, Korean, and Filipino as the five largest Asian groups in Austin, and these groups comprise about 87% of the total Asian population in the area (U.S. Census Bureau, 2012).

The 10-page questionnaire for the AAQoL was originally developed in English and then translated into the languages being used by the aforementioned major Asian groups (Chinese, Vietnamese, Korean, Hindi, Gujarati, and Tagalog). In the case of Chinese, both traditional and simplified versions were prepared. The initial translations were conducted by eight professional translators and graduate-level bilingual researchers. For each language, the translated version was reviewed for accuracy by two or more bilingual volunteers. Upon refinement of the questionnaire, each language version was pilot tested with three to five community members who were representative of the target group and spoke the target

language. The educational level of the community members ranged from below high school graduation to beyond colleague graduation, and their feedback was incorporated into the final version.

Recognizing that Asian Americans are often difficult to locate using standard recruitment strategies and that reliance on a single source can increase the chances for bias (Islam, Khan, Kwon, Jang, Ro, & Trinh-Shevrin, 2010), multiple potential survey sites were contacted. In addition, the project was publicized through media and ethnic community sources, and referrals for individuals, groups, and organizations were actively sought. A total of 76 survey sessions took place at various locations and events across the City of Austin (e.g., churches, temples, grocery stores, small group meetings, and cultural events) from August to December 2015. The surveys were self-administered using paper and pencil, and participants used their preferred language version. Bilingual research assistants at each survey site were engaged in recruitment and provided survey assistance. It took about 20 min to complete the 10-page questionnaire, and respondents were each paid US $10 for their participation. The project was approved by the University of Texas at Austin's Institutional Review Board.

A total of 2,614 individuals participated. After removing cases with missing information on the acculturation-related variables, the final sample size was 2,602. More information on survey procedures and sample characteristics is available elsewhere (City of Austin, 2017).

Measures

Acculturation-related variables—Seven variables relating to acculturation were used in latent modeling: nativity, proportion of life lived in the United States, English speaking ability, familiarity with host culture, familiarity with heritage culture, identity toward ethnic origin, and sense of belonging to the community of ethnic origin. Nativity was coded as 0 (*foreign-born*) and 1 (*U.S.-born*). Given that the length of stay in the United States is subject to one's chronological age, each participant's proportion of life lived in the United States was calculated: (years in the United States ÷ chronological age) × 100. English speaking ability was assessed with a question about how well the respondent spoke English, using a 4-point scale ranging from 1 (*not at all*) to 4 (*very well*). Participants were also asked to rate their level of familiarity with the culture of mainstream America on a 4-point scale ranging from 1 (*very low*) to 4 (*very high*). Another question in the same format was asked in reference to their heritage culture. Participants were also asked to rate how closely they identify themselves with people of their ethnic origin on a 4-point scale ranging from 1 (*not at all*) to 4 (*very closely*). They were also asked to rate how much they feel that they belong to the community of their ethnic origin on a scale ranging from 1 (*not at all*) to 4 (*very much*).

Demographic characteristics—Background information included age (0 = 18–39, 1 = 40–59, 2 = 60 and older), gender (0 = male, 1 = female), marital status (0 = married, 1 = not married), education (0 = high school graduation, 1 = < high school graduation), and ethnic origin (0 = Chinese, 1 = Asian Indian, 2 = Korean, 3 = Vietnamese, 4 = Filipino, 5 = Other Asian).

Health indicators—Three questions were used to measure self-rated health ("How would you rate your overall health status at the present time?"), self-rated oral health ("How would you rate your oral health at the present time?"), and self-rated mental health ("How would you rate your emotional or mental health at the present time?"). Response to each question was originally recorded on a 5-point scale and then dichotomized into 0 (*excellent/very good/good*) and 1 (*fair/poor*). The single-item measures of physical, oral, and mental health have shown to be highly correlated with the results of clinical examination and often been used as a binary format in health research (Fleishman & Zuvekas, 2007; Jones et al., 2001; Miller & Wolinsky, 2007).

Analytic Strategy

Latent profile analysis on the seven acculturation-related variables was conducted. The optimal number of clusters was evaluated based on conceptual meaning and indices of model fit including Bayesian information criterion (BIC), entropy, Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), bootstrap likelihood test (BLRT), and posterior probabilities. Once the optimal model solution was identified, the resulting acculturation groups were compared with regard to criterion variables and appropriate names were assigned. The groups were then compared with respect to demographic characteristics and health indicators. Chi-square tests and analyses of variance were used in group comparisons. Finally, logistic regression models of health indicators (fair/poor ratings of health, oral health, and mental health) were estimated. Models were tested both with and without adjustment for demographic characteristics. Analyses were performed using Mplus (Muthén & Muthén, 1998–2012) and SPSS statistical programs.

Results

Characteristics of the Overall Sample

In the overall sample ($N = 2,602$), the mean age was 42.8 ($SD = 17.1$), ranging from 18 to 98. About 20% of the participants were 60 and older. More than half (55.1%) were female, and 33.5% were unmarried. About 19% had received less than a high school education. The sample included Chinese (24.5%), Asian Indian (22%), Korean (18%), Vietnamese (19.7%), Filipino (10.1%), and other Asians (5.6%); this distribution closely mirrors the U.S. Census-reported ethnic composition of the Asian population in the area (U.S. Census Bureau, 2012).

It is noteworthy that almost half of the participants (48.5%) requested surveys employing languages other than English. Koreans had the highest rate of using the non-English version (78.8%), followed by Vietnamese (71.3%), Chinese (68.5%), Asian Indians (11.5%), other Asians (5.5%), and Filipinos (5.3%). Because of the history of British and U.S. occupation, Asian Indians and Filipinos generally show a high rate of English use. Overall, the availability of the survey questionnaire in Asian languages enabled many non-English speaking individuals to participate, resulting in a wide range of score distributions in acculturation-related variables.

Latent Profile Analysis

Latent profile analyses began with a two-cluster model and subsequently increased the number of clusters. Table 1 presents the results of latent profile analyses from two- to four-cluster models. The analyses were stopped at the four-cluster model because models with more than four clusters did not converge properly. Based on multiple model-fit criteria and theoretical consideration, the four-cluster model was identified as most optimal. Generally, lower BIC values and higher entropy (i.e., an index of classification quality) values indicate higher model fit and classification quality. The two likelihood ratio tests (LMR-LRT and BLRT) compare two adjacent models: the $(c - 1)$-cluster model versus the c-cluster model, with significant p values suggesting the current model performs better than the prior model. Another consideration for determining the number of clusters was to evaluate posterior probabilities, which contains the matrix of conditional probabilities for cases to be placed in their respective cluster; diagonal values closer to one indicate higher classification quality.

The results suggest that the four-cluster model had the lowest BIC value and the highest entropy value. Although likelihood tests indicated the four-cluster model was no better than the three-cluster model, it performed superior in other indices. The diagonal values of the matrix of conditional probabilities in the four-cluster solution (not shown in the Table) ranged from .83 to .99, demonstrating decent classification quality. Also the four-cluster model was conceptually congruent with other typologies of acculturation that differentiated the level of affinity to host culture (e.g., Salas-Wright, Clark, et al., 2015; Salas-Wright, Lee, et al., 2015; Schwartz & Zamboanga, 2008). Based on statistical and conceptual considerations, we selected the four-cluster model as the most optimal solution.

Profiles of the Acculturation Groups

Table 2 presents the characteristics of the four acculturation groups with respect to the seven acculturation-related variables on which the groupings were based. The graphical illustration of the profiles using standardized scores is provided in Figure 1. After a careful review of the score distributions, the groups were named *fully bicultural*, *moderately bicultural*, *alienated from host culture*, and *alienated from heritage culture*.

Seventeen percent of the sample ($n = 440$) was included in the fully bicultural group, which can be characterized as having a strong orientation toward not only host culture but also that of their ethnic origin. Approximately 15% of this group were U.S.-born, and, on average, members had spent more than half (53%) of their life in the United States. Scores on English speaking ability, familiarity with both host and heritage cultures, identity toward ethnic origin, and sense of belonging to the community of ethnic origin ranked highest among the four groups.

The moderately bicultural group was the largest, encompassing 47% of the overall sample ($n = 1,222$). This group parallels the fully bicultural group but presented lower scores on all acculturation-related variables.

The alienated from host culture group included 24% of the sample ($n = 614$). All were foreign-born and, on average, members had spent less than a quarter (23%) of their life in the United States, the lowest of the four groups. Not surprisingly, members scored quite low

on English speaking ability and familiarity with host culture. On the other hand, they maintained a fairly high level of familiarity with heritage culture, identity toward ethnic origin, and sense of belonging to their community of ethnic origin. In general, members of this group represent individuals in an early stage of immigration and/or those who have difficulties in adapting to a new culture and society.

Finally, and with 13% of the sample ($n = 326$), the alienated from heritage culture group was the smallest and characterized by a notably low orientation toward their heritage culture. Its members were least familiar with culture of origin and retained the lowest level of identity toward ethnic origin and sense of belonging to their community of ethnic origin. With respect to the proportion of life lived in the United States, English speaking ability, and familiarity with host culture, the group scored lower than the moderately bicultural group but higher than the alienated from host culture group.

Demographic Characteristics and Health Indicators of the Acculturation Groups

The four acculturation groups were also compared regarding their demographic characteristics and health indicators (see Table 3). All variables except sex resulted in statistically significant group differences. The *fully bicultural* group was more likely to include the two younger groups (18–39 and 40–59) and those who had received at least a high school education. The alienated from host culture group included the highest proportions of older adults and those who received less than a high school education. In terms of ethnic origin, Chinese and Vietnamese were most represented in the alienated from host culture (28% and 28.5%, respectively), Asian Indians and Filipinos were more likely to be included in the fully bicultural (24.5% and 21.1%, respectively), and Koreans in the moderately bicultural (25.2%).

With respect to health indicators, the fully bicultural group demonstrated the most favorable health outcomes. Their rate of reporting a fair/poor status was 3.4% for self-rated health, 6.8% for self-rated oral health, and 3.4% for self-rated mental health, all of which were substantially lower than those observed in the other groups. In contrast, the highest rate of reporting a fair/poor self-rated health and self-rated mental health was found among those in the alienated from heritage culture (13.5% for self-rated health and 12% for self-rated mental health). The alienated from host culture group demonstrated the least favorable outcome with respect to oral health, with more than 22% reporting a fair/poor status.

Logistic Regression Models of Health Indicators

Table 4 summarizes the results of both unadjusted and adjusted logistic regression models testing the associations of acculturation profiles with health indicators (fair/poor ratings of health, oral health, and mental health). In both sets of analyses, the reference group was the fully bicultural. In the unadjusted models, increased odds of reporting a fair/poor condition were found in each of the three acculturation groups for all health indicators. The same pattern and significance persisted in the subsequent models after adjustment for demographic characteristics. In the adjusted models, the other three groups were 2.07–3.16 times more likely than the fully bicultural to report fair/poor health, oral health, and mental health. The alienated from heritage culture group were 3.16 times (95% confidence interval

[CI] = 1.65–6.06, $p < .001$) more likely to report a fair/poor rating of health and 2.82 times (95% CI = 1.47–5.43, $p < .001$) more likely to report a fair/poor rating of mental health than the fully bicultural. With respect to oral health, the alienated from host culture group was at the highest risk, being 2.80 times (95% CI = 1.78–4.40, $p < .001$) more likely to have a fair/poor rating than the fully bicultural.

Discussion

Building upon the growing literature on acculturation in ethnic minority populations (Berry et al., 2006; Chun et al., 2003; Sam & Berry, 2016), the present study examined the latent model of acculturation and its association with health risks in a sample of Asian Americans. One prompt for the study was a concern that Asian Americans with language barriers might not be adequately represented in existing population-based studies (Jang et al., 2016). A recent study (Salas-Wright, Lee et al., 2015), for example, explored the latent profiles of acculturation in Asian/Pacific Islanders who participated in the National Epidemiological Survey on Alcohol and Related Conditions (NESARC); however, the exclusion of non-English speaking individuals in the NESARC calls generalizability of findings into question. Population-based surveys conducted only in English are not equipped to generate a representative sample of Asian Americans, and the use of such upwardly biased samples is of particular concern in research on acculturation. The thrust of the present study was addressing the issues of acculturation using a sample that reflects the target population's cultural and linguistic diversities.

Our survey efforts drew heavily on principles of community-based research partnerships (e.g., Israel, Schulz, Parker, & Becker, 1998). To reach out to diverse groups of Asian Americans, culturally and linguistically sensitive approaches were used. The strategies included providing not only Asian language versions of the survey questionnaire but also research personnel (e.g., recruiters and survey assistants) who shared the languages and cultures of the target population. Furthermore, the strong partnership between the research team and key individuals and organizations within ethnic communities facilitated the participation of community members. The fact that almost half of the present sample used non-English versions of the survey questionnaire indicates that our culturally and linguistically sensitive approaches enabled many individuals who are conventionally unrepresented in national surveys to be included, resulting in a better representation of acculturation and health among Asian Americans.

In our main analysis, latent profiling on an array of acculturation-related variables (nativity, proportion of life lived in the U.S., English speaking ability, familiarity with host culture, familiarity with heritage culture, identity toward ethnic origin, and sense of belonging to the community of ethnic origin) identified a four-cluster solution: fully bicultural, moderately bicultural, alienated from host culture, and alienated from heritage culture. When compared to the four typologies (integration, assimilation, separation, and marginalization) proposed in Berry's (1992, 1997) seminal work and the latent models observed in the recent studies (e.g., Salas-Wright, Clark et al., 2015; Salas-Wright, Lee et al., 2015; Schwartz & Zamboanga, 2008), our findings present both similarities and differences.

The fully bicultural group most closely resembled the integration cell in Berry's model with the strong orientations toward both host and heritage cultures. Represented by 17% of the sample, this fully bicultural group exhibited the most favorable characteristics in terms of personal resources and health indicators considered in the present study. In a series of logistic regression models that used the fully bicultural group as a reference, the other groups were at least twice as likely to report being in fair/poor physical, oral, and mental health. The advantages of being bicultural have consistently been reported in the acculturation literature (Berry et al., 2006; Chun et al., 2003; Sam & Berry, 2016; Schwartz et al., 2010). Integration in both heritage and host cultures seems to allow individuals to draw various types of resources from both cultural contexts and enable them enjoy health benefits.

Our latent model also identified the *moderately bicultural* group as a distinguished cluster. Members of this group scored consistently lower on all acculturation-related variables in comparison to the fully bicultural group but still displayed a fairly strong orientation to both cultures. This group is considered as a variant of Berry's integration type, and such emergence of subtypes of bi-culturalism is in line with previous studies (e.g., Salas-Wright, Clark et al., 2015; Salas-Wright, Lee et al., 2015; Schwartz & Zamboanga, 2008). Encompassing 47% of the sample, the moderately bicultural group was the most dominant one. Members of this group demonstrated a reduced health benefits when compared to those of the fully bicultural group.

The alienated from host culture group resembled Berry's separation cluster with a fairly strong adherence to heritage culture but lack of orientation toward host culture. Not surprisingly, all members of this group were foreign-born, and they had spent only a small proportion of their lives in the United States. They also tend to be older and least educated. Members of this group had adverse health outcomes in general, but their oral health was at a particular risk. This group represents individuals who lack personal resources that allow them to be engaged in the mainstream society, and such individuals are often disadvantaged in health and health care (Jang et al., 2016). With regard to their particular vulnerability to oral health risks, the finding might be explained by the unique nature of dental care. Because social insurance programs in the United States offer no or limited coverage for dental care (Institute of Medicine, 2011), oral health is highly influenced by personal resources (e.g., ability to pay the cost, navigate dental care systems, and communicate with dental care professionals). Individuals who lack such resources, like many of those in the alienated from host culture group, tend to have a heightened burden in oral health and dental care (Jang et al., 2016). Given their challenges, ways to enable individuals in an early stage of immigration and/or with cultural and linguistic barriers to have an access to dental care should be sought. Effort may include education and outreach programs, language assistance, and patient navigation services.

Although the alienated from heritage culture group was clearly distinguished by its relatively low adherence to heritage culture, it did not resemble either the marginalization or assimilation in Berry's model. With regard to the orientation toward host culture, the group scored too high to be classified as marginalized but too low to fall in the assimilation category. The group was represented by the smallest proportion of the sample (13%) but

exhibited heightened risks in physical and mental health. This finding aligns with the literature suggesting the vulnerability of ethnic immigrants who lack a foundation in their culture of origin (Berry et al., 2006; Chun et al., 2003; Sam & Berry, 2016). Given that this group tends to include many of younger generations of U.S.-born Asian Americans, efforts to help them retain their cultural roots and develop cultural identities should be prioritized.

It was interesting to note that the profiles generated from the present sample did not include distinctive marginalization and assimilation cells of the Berry's original model. Previous studies on latent modeling of acculturation have often reported the absence of the marginalization group (e.g., Salas-Wright, Clark et al., 2015; Salas-Wright, Lee et al., 2015; Schwartz & Zamboanga, 2008). It is also in line with the argument that rejection of both host and heritage cultures is highly unlikely among ethnic minorities (Schwartz et al., 2010). Our findings lend supports to the criticism on the theoretical assumption of the four-cell classification of acculturation (Schwartz et al., 2010).

On the other hand, the absence of the assimilation group was unique to the present sample. Previous studies have consistently shown the saliency of the assimilation group in their latent profiles (e.g., Salas-Wright, Clark et al., 2015; Salas-Wright, Lee et al., 2015; Schwartz & Zamboanga, 2008). Indeed, the assimilation group was the dominant one profiled in the NESARC, with one in four Asian/Pacific Islanders being a member of the group (Salas-Wright, Lee et al., 2015). However, the present study found no group characterized by a low adherence to heritage culture but a high adherence to host culture. The difference might be attributed to the sample characteristics, since the NESARC excluded non-English speaking Asian Americans, and this study fully embraced them by using culturally and linguistically sensitive recruitment approaches. The present sample, therefore, included individuals who represent the low end of acculturation, which resulted in the emergence of new acculturation patterns. It is also noteworthy that the present sample exhibits a wide range of score distributions on both heritage and host cultures.

Some limitations of the present study should be noted. The foremost concern is the limited representativeness of the sample. Although the study successfully reached out to the many Asian Americans who were conventionally excluded in English-only surveys, caution should be exercised in applying the findings to the larger population of Asian Americans. Given that our sample was regionally defined and that the environment offers an important context in the lives of ethnic minorities (Schwartz et al., 2010), future studies should be conducted in various regions in considerations of contextual differences (e.g., proportion of ethnic minorities and social/political climates in the area). Another limitation is that the inference of causal directionality cannot be made with the current cross-sectional design. The snapshot approach is not equipped to properly address the dynamic processes of cultural adaptation. Being part of a large initiative, the measures of acculturation and three health indicators employed in the AAQoL survey were rather brief. Although the selected acculturation-related items well-represent the construct that the study intends to address (Salas-Wright, Clark et al., 2015; Salas-Wright, Lee et al., 2015; Schwartz & Zamboanga, 2008; Schwartz et al., 2010) and there is an empirical support for the validity of a single-item measure of health (Fleishman & Zuvekas, 2007; Jones et al., 2001; Miller & Wolinsky, 2007), future research should use refined measures in assessing the constructs of acculturation and health.

Furthermore, future studies need to explore the role of psychosocial resources (e.g., self-esteem, social support, and family solidarity) to better understand the interplays between acculturation and health.

Despite these limitations, the present study sheds light on the importance of using culturally and linguistically sensitive approaches to reach out to diverse groups of Asian Americans. Furthermore, our findings on the profiles of acculturation hold implications for interventions with respect to the groups to be prioritized and the strategies to be used. Intervention efforts may be targeted on groups of individuals who are at particular health risk: the alienated from heritage culture and alienated from host culture. Offering opportunities to create a greater involvement with their host culture and/or culture of origin is an important consideration for interventions.

Acknowledgments

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What is the public significance of this article?

The present study identified latent profiles of acculturation in Asian Americans and explored the health risks associated with the profiles. Pointing out the upward selection bias of Asian Americans in English-only surveys, the study calls attention to the importance of obtaining Asian American samples that reflect the group's cultural and linguistic diversities. Furthermore, the findings hold implications for interventions with respect to the groups to be prioritized and the strategies to be uszed.
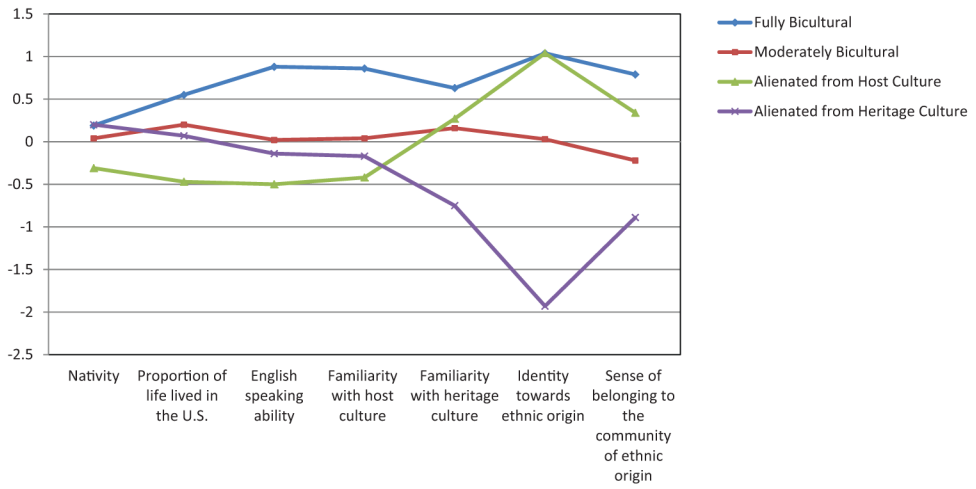
Figure 1.
Score distributions of the four acculturation groups. See the online article for the color version of this figure.

Table 1

Model Fit Statistics for Selecting the Optimal Number of Acculturation Groups

Model	BIC	Entropy	LMR-LRT ($H_0 = k - 1$ classes)	BLRT ($H_0 = k - 1$ classes)
2-cluster	54236.91	.87	$p = .00$	$p = .00$
3-cluster	52845.49	.80	$p = .00$	$p = .00$
4-cluster	**51426.37**	**.90**	**$p = 1.00$**	**$p = 1.00$**

Note. BIC = Bayesian Information Criterion; LMR-LRT = Lo-Mendell-Rubin likelihood ratio test; BLRT = bootstrap likelihood ratio test. The best cluster solutions can be achieved with low BIC values, high entropy (i.e., an index of the classification quality). In addition, the LMR-LRT and BLRT compare the current model (c-cluster) with prior model (c − 1 cluster). The significant *p*-value suggests that the current model performs better than the prior model; the selected model is in bold.

Table 2

Profiles of the Four Acculturation Groups (N = 2,602)

Variable	$M = SD$ or %				$F(\chi^2)$
	Fully bicultural (n = 440)	Moderately bicultural (n = 1,222)	Alienated from host culture (n = 614)	Alienated from heritage culture (n = 326)	
Nativity (U.S.-born)	14.8	10.2	.00	15	(93.5^{***})
Proportion of life lived in the U.S.[a]	52.9 ± 26.6	37.5 ± 29.2	23.5 ± 17.9	39.3 ± 33.8	99.6^{***}
English speaking ability	$3.82 \pm .39$	$2.97 \pm .92$	$2.52 \pm .83$	2.86 ± 1.02	204.6^{***}
Familiarity with host culture	$3.50 \pm .51$	$2.78 \pm .76$	$2.48 \pm .65$	$2.68 \pm .91$	179.1^{***}
Familiarity with heritage culture	$3.62 \pm .53$	$3.07 \pm .63$	$3.37 \pm .65$	$2.65 \pm .77$	173.9^{***}
Identity toward ethnic origin	$4.00 \pm .02$	$3.00 \pm .01$	$4.00 \pm .00$	$1.90 \pm .29$	38181.1^{***}
Sense of belonging to the community of ethnic origin	$3.68 \pm .55$	$2.88 \pm .64$	$3.32 \pm .73$	$2.36 \pm .80$	294.3^{***}

[a]The proportion of life lived in the United States = (years in the U.S. ÷ chronological age) × 100; reported values are subsample means and standard errors of the proportions (%).

***
$p < .001$.

Table 3

Demographic Characteristics and Health Indicators of the Four Acculturation Groups

Characteristic	%				
	Fully bicultural (n = 440)	Moderately bicultural (n = 1,222)	Alienated from host culture (n = 614)	Alienated from heritage culture (n = 326)	χ^2
Demographic information					
Age					32.1***
18–39	48.6	51.1	40.9	52.2	
40–59	36.5	28.6	34.7	26.9	
60 and older	14.8	20.3	24.3	21.0	
Female	54.3	53.9	57.1	57.1	2.23
Unmarried	31.0	35.1	28.5	40.3	16.1**
<High school graduation	8.9	16.5	27.8	22.8	67.8***
Ethnic origin					220.2***
Chinese	17.3	25.2	28.0	24.8	
Asian Indian	24.5	22.6	21.0	18.4	
Korean	7.5	25.2	12.1	16.6	
Vietnamese	21.6	14.2	28.5	21.2	
Filipino	21.1	8.3	6.5	9.2	
Other	8.0	4.5	3.9	9.8	
Health Indicator					
Fair/poor self-rated health	3.4	12.0	11.6	13.5	29.9***
Fair/poor self-rated oral health	6.8	20.1	22.5	19.1	48.6***
Fair/poor self-rated mental health	3.4	9.4	9.0	12.0	20.9***

**
$p < .01$.

***
$p < .001$.

Table 4

Association of the Profiles of Acculturation with Health Indicators

Model and profile	Odds ratio (95% confidence interval)		
	Fair/poor self-rated health	Fair/poor self-rated oral health	Fair/poor self-rated mental health
Unadjusted model			
Profiles of acculturation			
Fully bicultural	1.0 [reference]	1.0 [reference]	1.0 [reference]
Moderately bicultural	3.87 *** (2.24–6.65)	3.43 *** (2.31–5.09)	2.94 ** (1.69–5.09)
Alienated from host culture	3.72 *** (2.10–6.58)	3.95 *** (2.61–6.00)	2.80 ** (1.55–5.02)
Alienated from heritage culture	4.42 *** (2.41–8.09)	3.22 *** (2.03–5.11)	3.86 *** (2.09–7.14)
−2 Log likelihood	1726.8	2409.8	1501.6
Adjusted model[a]			
Profiles of acculturation			
Fully bicultural	1.0 [reference]	1.0 [reference]	1.0 [reference]
Moderately bicultural	2.69 ** (1.51–4.81)	2.64 *** (1.72–4.05)	2.26 ** (1.26–4.04)
Alienated from host culture	2.54 ** (1.38–4.68)	2.80 *** (1.78–4.40)	2.07 * (1.11–3.85)
Alienated from heritage culture	3.16 ** (1.65–6.06)	2.58 *** (1.55–4.27)	2.82 ** (1.47–5.43)
−2 Log likelihood	1468.3	1991.2	1329.2

[a] Model adjusted for demographic variables (age, gender, marital status, education, and ethnic origin).

* $p < .05$.

** $p < .01$.

*** $p < .001$.