Asian American Multidimensional Acculturation Scale: Development, Factor Analysis, Reliability, and Validity

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This article describes the development and psychometric properties of the Asian American Multidimensional Acculturation Scale (AAMAS). The results of 3 separate studies provide strong evidence of the instrument's reliability and validity. The principles for the development of the AAMAS were orthogonality of cultural dimensions, inclusion of a pan-ethnic Asian American dimension, and ease of use across ethnic groups. Exploratory and confirmatory factor analyses indicate that within each cultural dimension (AAMAS–Culture of Origin, AAMAS–Asian American, and AAMAS–European American) there are 4 reliable acculturation domains of cultural identity, language, cultural knowledge, and food consumption. These features of the AAMAS allow for a more complex assessment of acculturation level of Asian Americans and its relationship to psychological functioning.

• *Asian American • acculturation • identity • pan-ethnicity*

The acculturation process of immigrant minorities is one of the most investigated topics within multicultural research. Interest in examining this complex process from an empirical perspective has led to the development of various measures, each closely linked to one of two models of acculturation. Szapocznik, Kurtines, and Fernandez

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(1980) described one model of acculturation as a *unidimensional*, zero-sum process. That is, individuals adopting host-culture attributes, such as behaviors and values, simultaneously discard these same attributes that correspond to their culture of origin. Several writers have been critical of this model (e.g., Mendoza, 1989; Ramirez, 1984), arguing that unidimensional measures of acculturation are limited in their ability to represent *true biculturation*, defined as the attainment of high adherence to native and host cultures. For example, Ramirez (1984) stressed the notion that a bicultural person is an individual who "has had extensive socialization and life experiences in two or more cultures and participates actively in these cultures" (p. 82). A second model of acculturation conceptualizes this process *bidimensionally*, occurring on two different continua, each representing a level of adherence to one specific culture. Accordingly, measures based on the bidimensional model assess acculturation to native and host cultures independently (orthogonally), providing a metric that permits identification of individuals as being acculturated to one culture, two cultures, or neither culture.

In a review of the acculturation literature, Kim and Abreu (2001) observed that most of the existing acculturation measures were based on the unidimensional model, which, according to Cortes, Rogler, and Malgady (1994), incorrectly "assume increments of involvement in the American host society culture necessarily entail corresponding decrements of disengagement from the immigrant's traditional culture" (p. 587). Thus, these measures do not permit accurate determination of the degree to which a respondent may be involved in acculturation to the host culture and acculturation to the Asian culture of origin.

Although acculturation has been identified as the leading variable in mental health research (Heath, Neimeyer, & Pedersen, 1988; Ponterotto, Baluch, & Carielli, 1998), there has been a notable shortage of research tools to assess this complex phenomenon for Asian Americans. Kim and Abreu (2001) listed only 4 measures for Asian Pacific Americans in comparison with 27 measures for Hispanic groups. Among the measures tapping Asian American acculturation, only one predominates: the Suinn–Lew Asian Self-Identity Acculturation Scale (SL–ASIA; Suinn, Rickard-Figueroa, Lew, & Vigil, 1987). With the exception of one additional measure for Chinese Americans by Tsai, Ying, and Lee (2000) that was published after this study was conducted, others, including the SL–ASIA, are based on the unidimensional model. Given the limitations inherent to unidimensional models of acculturation and the fact that there were no available measures to assess Asian Americans acculturation bidimensionally, we set out to develop and test the Asian American Multidimensional Acculturation Scale (AAMAS). In this article, we describe the development of the AAMAS and present its psychometric properties, including evidence of its reliability and validity.

Instrument Development

In the development of the AAMAS, three principles guided its structure. The first was that the AAMAS was to be orthogonal and distinguish between the dimensions of acculturation to host culture and Asian culture of origin. This criterion was adopted in deference to the emerging consensus regarding the superiority of the orthogonal model over the traditional unidimensional model (Cortes et al., 1994; Cuellar, Arnold, & Maldonado, 1995; Kim & Abreu, 2001).

The second guiding principle for the development of AAMAS was that it should extend the orthogonal conception of acculturation to a third dimension: a pan-ethnic Asian American culture. This new and unique feature was incorporated into the AAMAS based on theoretical and empirical developments in the field of Asian American studies, notably in the work of Le Espiritu (1992). According to Le Espiritu, panethnicity is formed as the result of a com-

plex and continuing interplay of external and internal forces. External forces are in the form of imposed categorization by the more powerful majority group based on stereotypic notions of perceived homogeneity. In other words, "Panethnicity—the generalization of solidarity among ethnic subgroups—is largely a product of categorization" (Le Espiritu, 1992, p. 6). However, once formed, pan-ethnicity may be appropriated as a political resource and serves as a basis for mobilization and collective empowerment. It is within this context that the internal forces also take shape in the form of a new, emergent collective culture. According to Cohen (cited in Le Espiritu, 1992, p. 8), "when different cultural groups affiliate themselves in opposition to other groups, their differences quickly disappear. As group members borrow customs from one another, intermarry, and develop a common lifestyle, a common culture emerges." The AAMAS measures the extent to which there is a consistent underlying structure for such an emergent pan-ethnic culture, particularly in the domains of cultural identity, language, cultural knowledge, and food consumption. Given the predominant sociopolitical focus of existing theory and research on pan-ethnicity to the exclusion of the sociocultural dimension, one of the contributions of this study is in finding empirical evidence in support of an identifiable pan-ethnic culture. The need to include a pan-ethnic dimension is further underscored by the fact that Asian Americans are increasingly marrying interethnically among Asian American group (Shinagawa & Pang, 1996), thus making the emergence of some form of pan-ethnic culture quite likely regardless of the sociopolitical dimension.

The third guiding principle for the development of the AAMAS was ease of use with multiple Asian ethnic groups. Currently, the existing measures of acculturation are ethnic specific and therefore often involve multiple modifications in studies of different Asian American groups or use a generic *Asian American* label that many may not identify with. In our measure, we use the phrase *culture of origin* to allow the reader to insert his or her culture without having to list each group individually or use a generic term. At the same time, inclusion of the pan-ethnic dimension allows for greater flexibility for those who are product of interethnic marriages and a more nuanced approach to measurement of cultural change process.

In sum, the AAMAS represents a unique combination of the three defining features of (a) orthogonality of cultural dimensions, (b) inclusion of a pan-ethnic dimension, and (c) applicability across multiple ethnicities. These features were deemed necessary in recognition of the diversity that exists within the Asian American population and the complexity of the acculturation process.

The specific items for the AAMAS were adapted largely from the SL–ASIA and converted to a multilinear format by asking respondents to rate each item according to three referent groups: (a) their culture of origin, (b) other Asian Americans, and (c) European Americans. Consequently, the AAMAS comprises three scales: (a) AAMAS–Culture of Origin (AAMAS–CO), (b) AAMAS–Asian American (AAMAS–AA), and (c) AAMAS–European American (AAMAS–EA).

Each AAMAS scale consists of 15 items and uses a 6-point Likert type scale ranging from *not very much* to *very much*; one of the items is worded in a reverse direction. The instrument is structured such that the three ethnic groups are listed under each of the items, with each group followed by the 6-point rating scale. In terms of the construct domains of acculturation measured by the 15 items, 10 items measure cultural behavior, 3 items measure cultural identity, and 2 items measure cultural knowledge. (For the purposes of the present study, *cultural dimension* refers to the three AAMAS referent ethnic groups, whereas *construct domain* refers to the four factors of acculturation captured by the AAMAS items.) For data analysis, AAMAS scores were based on the average rating (ranging from 1 to 6) for each scale across the 15 items.

Study 1: Initial Examination of Reliability, Validity, and Factor Structure

Method

PARTICIPANTS. A total of 342 (118 men and 223 women; 1 person did not indicate gender) Asian American undergraduates attending a large West Coast university participated in this study. They ranged in age from 17 to 31 years (M = 20.8, SD = 1.7), with a vast majority (99%) indicating single marital status. Participants included 28 (8%) freshmen, 77 (22%) sophomores, 66 (19%) juniors, 136 (40%) seniors, and 33 (10%) students in their 5th year or beyond; 2 participants (1%) did not indicate the number of years in school.

In terms of ethnicity, 95 (28%) participants were Chinese, 91 (27%) Korean, 47 (14%) Japanese, 42 (12%) Filipino, and 38 (11%) Vietnamese; the remaining participants identified with an "other Asian American" category that included Singaporean, Cambodian, Indonesian, Lao, Thai, and Asian biethnic/biracial or did not report their ethnicity. In terms of generational status in the United States, 194 (57%) respondents were first generation (foreign-born), 96 (28%) second generation, 9 (3%) third generation, 28 (8%) fourth generation, and 12 (4%) who indicated being fifth generation and above (3 participants did not indicate generational status). Among those who indicated first-generational status, the length of residence in the United States ranged from 2 to 22 years (M = 13.9, SD = 4.0). Those who had parents of differing generations were instructed to calculate their own generation based on the parent of the higher generation.

QUESTIONNAIRE. To examine the psychometric properties of the AAMAS, we prepared a questionnaire that consisted of the three AAMAS scales, the SL–ASIA (Suinn et al., 1987), the Cultural Identification Scale (CIS; Oetting & Beauvais, 1991), the Intergenerational Conflict Inventory (ICI; Chung, 2001), and a demographic section. We discuss each of these briefly below.

The 21-item SL–ASIA measure taps different aspects of acculturation, including language (4 questions), friendship choice (4 questions), behaviors (5 questions), generation/geographic history (3 questions), identity (4 questions), and attitudes (1 question). Respondents rate the items on a 5-point scale, with low scores reflecting high Asian identification and low acculturation to Western culture, and high scores indicating low Asian identification and high acculturation to Western culture; scores in the middle reflect biculturalism. Coefficient alphas ranging from .88 to .91 have been reported (Suinn, Ahuna, & Khoo, 1992). For the present data analyses, average ratings (ranging from 1 to 5) across the 21 SL–ASIA items were used; coefficient alpha was calculated at .84.

The CIS measure contains two scales that assess identification to native and Anglo cultures. The CIS–Anglo scale comprises four items that measure the level of and success in the participant's and his or her family's adherence to a White American way of life. Responses to these questions are based on a 4-point scale ranging from *not at all* to *a lot*. The CIS–Origin scale is identical to the CIS–Anglo except that the word *White American* is replaced by the respondent's culture of origin. Oetting and Beauvais (1991) reported low correlations between the two CIS scales, suggesting orthogonality. In terms of internal consistency, Oetting and Beauvais reported coefficient alphas ranging from .88 to .87 for the CIS–Anglo and .80 to .89 for the CIS–Origin. The results of the present study yielded coefficient alphas of .77 for the CIS–Anglo and .75 for the CIS–Origin. Average ratings (ranging from 1 to 4) across the items in each of the two CIS scales were used for the present analyses. The CIS was selected for this study because of its ease of use and the fact that it was one of few existing measures that was based on an orthogonal model at the time that the study was conducted. This measure has been found to be reliable and valid for use with Asian Americans (Johnson, Wall, Guanipa, Terry-Guyer, & Velasquez, 2002).

The 24-item ICI instrument measures type and severity of intergenerational conflict between Asian American adolescents/young adults and their parents. The items were developed on the basis of Erikson's (1963) psychosocial stages and the literature on culturally relevant and age-appropriate issues affecting an adolescent's relationship to the family and negotiation of independence (Chung, 2001). The ICI uses a 6-point Likert type scale ranging from *no conflict over this issue* to *a lot of conflict over this issue*. The ICI yields a total score derived from an 11-item Family Expectation (ICI–FE) scale, a 10-item Education and Career (ICI–EC) scale, and a 3-item Dating and Marriage (ICI–DM) scale; these scales were developed using factor analysis (Chung, 2001). In terms of reliability, Chung reported coefficient alphas of .86 for ICI–FE, .88 for ICI–EC, and .84 for ICI–DM. In addition, Chung reported a range of .81 to .87 for a 7-week coefficient of stability. For the present data analyses, average ratings (ranging from 1 to 6) across items in each of the three ICI scales were used; coefficient alpha for the total scale was calculated at .92

PROCEDURE. Participants were recruited from various undergraduate courses with an offer of extra credit as an incentive to participate. In accordance with an approved petition to the Institutional Review Board (IRB) of research from the host university, all of the participants were told that if they chose to participate, their responses would remain anonymous. They also were informed that their participation was voluntary and that, if they chose not to participate, they could simply return an incomplete questionnaire without any penalty in the course. Of the 438 questionnaires distributed, 342 surveys were returned for a response rate of 78%.

Results

Means, standard deviations, and intercorrelations of the salient variables are presented in Table 1.

INTERNAL RELIABILITY. Coefficient alphas were computed for each of the three AAMAS scales. The results indicated a coefficient alpha of .87 for the AAMAS–CO scale, .78 for the AAMAS–AA scale, and .81 for the AAMAS–EA scale.

CRITERION-RELATED VALIDITY. Criterion-related validity was assessed by correlating each of the three AAMAS scale scores with participant generational status. As expected, the correlation between AAMAS–CO and generational status (–.36) indicated an inverse relationship; the correlations between the other AAMAS scales and generational status were nonsignificant (see Table 1).

CONCURRENT VALIDITY. Concurrent validity for the three AAMAS scales was examined by calculating the correlation coefficients between the scores obtained for each of the three AAMAS scales and the scores derived from the SL–ASIA, CIS–Origin, and CIS–Anglo. We expected a moderate relationship between the AAMAS scales and the SL–ASIA because both are measures of acculturation but use different measurement models. Similarly, because there is an overlap between the constructs of acculturation and ethnic identity, we also expected a moderate magnitude of correlation between the three AAMAS scales and the CIS–Asian and CIS–Anglo.

The results were generally in line with expectations. Correlations involving the AAMAS–CO yielded coefficients of –.75, .51, and –.30 in relation with the SL–ASIA, CIS–Origin, and CIS–Anglo, respectively. For the AAMAS–AA, correlation coefficients of –.31 and .26 were observed in its relationship with SL–ASIA and CIS–Origin, respectively; the correlation between AAMAS–AA and CIS–Anglo was not statistically significant. As for the AAMAS–EA, correlation coefficients of .32 and .49 were observed with the SL–ASIA and CIS–Anglo, respectively; the correlation between AAMAS–EA and CIS–Origin was not statistically significant.

DIVERGENT VALIDITY. Divergent validity was examined by comparing AAMAS scores with

TABLE 1 Means, Standard Deviations, and Intercorrelations Among Variables

Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1. AAMAS–CO	4.42	0.77	—										
2. AAMAS–AA	3.11	0.58	.44**	—									
3. AAMAS–EA	4.85	0.59	−.06	.10	—								
4. SL–ASIA	3.13	0.47	−.75**	−.31**	.32**	—							
5. CIS–Origin	3.35	0.52	.51**	.26**	−.03	−.44**	—						
6. CIS–Anglo	2.84	0.65	−.30**	−.04	.49**	.44**	−.10	—					
7. ICI	3.01	0.89	.20**	.17**	−.07	−.26**	.23**	−.12	—				
8. ICI–FE	3.03	1.07	.21**	.16**	−.01	−.26**	.19**	−.09	.89**	—			
9. ICI–EC	3.25	1.13	.12*	.13*	−.06	−.10	.19**	−.02	.82**	.57**	—		
10. ICI–DM	3.49	1.45	.16**	.07	−.11*	−.27**	.22**	−.17**	.68**	.54**	.47**	—	
11. Generation	—	—	−.36**	−.07	.03	.51**	−.21**	.21**	−.25**	−.25**	−.10	−.29	—

Note. AAMAS = Asian American Multidimensional Acculturation Scale; CO = Culture of Origin; AA = Asian American; EA = European American; SL–ASIA = Suinn–Lew Asian Self-Identity Acculturation Scale; CIS = Cultural Identification Scale; ICI = Intergenerational Conflict Inventory; FE = Family Expectation; EC = Education and Career; DM = Dating and Marriage; Generation = generation since immigration status (frequency is presented in the *Participants* section).

*$p < .05$. **$p < .01$.

ICI total and subscale scores. We expected relatively low correlations among these scales because acculturation and intergenerational conflict are conceptualized as two distinct psychological constructs with little overlap. For the AAMAS–CO, correlation coefficients of .20, .21, .12, and .16 were observed in its relationships with the ICI total score, ICI–FE, ICI–EC, and ICI–DM, respectively. For AAMAS–AA, correlation coefficients of .17, .16, and .13 were observed in its relationships with ICI total score, ICI–FE, and ICI–EC, respectively; there was no statistically significant relationship between AAMAS–AA and ICI–DM. Finally, a correlation coefficient of –.11 was observed between AAMAS–EA and ICI–DM; no other statistically significant correlations were obtained.

EXPLORATORY FACTOR ANALYSIS. Exploratory factor analyses were conducted to examine the factor structure underlying each of the three scales of the AAMAS. An initial factor analysis using the maximum likelihood estimation method was performed for each scale to generate a scree plot to determine the possible number of factors. The results of the scree plot suggested a four-factor solution for all three AAMAS scales. Based on this finding, two four-factor solutions were generated for each scale, with one solution using the varimax and another using the direct oblimin rotation methods. An examination of the data suggested that the varimax rotated solutions yielded the most interpretable solutions for all three scales, accounting for 56.7% of the variance for AAMAS–CO, 45.4% of the variance for AAMAS–AA, and 46.8% of the variance for AAMAS–EA. The factor loadings, means, and standard deviations for the items under each factor are presented in Table 2.

All AAMAS scales appear to have a similar four-factor structure, with one representing association with people (labeled Cultural Identity), another reflecting language proficiency (labeled Language), a third representing information about culture (labeled Cultural Knowledge), and a fourth reflecting food consumption (labeled Food Consumption). With just one exception, all of the items loaded under the same factor in each of the three scales. The exception is with the item, "How often do you listen to music or look at movies and magazines?" which loaded under Language in AAMAS–CO but under Cultural Knowledge in AAMAS–AA and AAMAS–EA.

Within AAMAS–CO, Cultural Identity, Language, Cultural Knowledge, and Food Consumption accounted for 17.0%, 17.8%, 12.5%, and 9.4% of the variance, respectively. In terms of internal reliability of the factors, coefficient alphas of .79, .89, .76, and .65 were observed, respectively. For AAMAS–AA, Cultural Identity, Language, Cultural Knowledge, and Food Consumption accounted for 13.0%, 13.8%, 10.4%, and 8.3% of the variance, respectively. In terms of internal reliability of the factors, coefficient alphas of .72, .84, .66, and .68 were observed, respectively. Finally, for AAMAS–EA, Cultural Identity, Language, Cultural Knowledge, and Food Consumption accounted for 14.5%, 14.9%, 9.2%, and 8.2% of the variance, respectively. In terms of internal reliability of the factors, coefficient alphas of .74, .87, .67, and .68 were observed, respectively.

Study 2: Further Examination of Reliability, Validity, and Factor Structure

Method

PARTICIPANTS. Participants were 138 (41 men and 97 women) Asian American undergraduates from a West Coast university. They ranged in age from 18 to 35 years with a mean of 21.3 (*SD* = 3.6). There were 23 (17%) freshmen, 38 (27%) sophomores, 29 (21%) juniors, 29 (21%) seniors, 18 (13%) 5th-year seniors and beyond, and 1 (1%) who did not indicate the number of years in school. Most (94.9%) participants indicated that they were single.

In terms of ethnicity, 42 (30%) were Chinese, 32 (23%) Korean, 17 (12%) multiethnic Asian, 13 (9%) Filipino, 12 (9%) Asian Indian, 12 (9%) Japanese, 6 (4%) Taiwan-

TABLE 2 Standardized Factor Loadings Based on Exploratory Factor Analyses, Means, and Standard Deviations

Item	*Standardized factor loading*				*M*	*SD*
	1	*2*	*3*	*4*		
AAMAS–Culture of Origin						
Factor 1: Cultural Identity						
How much do you feel you have in common with people	.77	.18	.22	.10	4.79	1.16
How much do you interact and associate with people from	.72	.16	.09	.11	5.09	1.23
How much do you identify with	.71	.27	.30	.18	4.96	1.17
How much would you like to interact and associate with people from	.57	.06	.15	.10	5.46	0.87
How proud are you to be a part of	.49	.08	.37	.08	5.55	0.74
How negative do you feel about people from[a]	–.26	.15	–.02	–.03	2.00	1.09
Factor 2: Language						
How well do you speak the language of	.08	.94	.20	.12	3.39	1.76
How well do you understand the language of	–.01	.82	.21	.22	3.97	1.63
How well do you read and write in the language of	.14	.69	.23	.02	2.55	1.67
How often do you listen to music or look at movies and magazines from	.25	.48	.29	.21	2.76	1.60
Factor 3: Cultural Knowledge						
How knowledgeable are you about the culture and traditions of	.23	.28	.83	.12	4.57	1.13
How knowledgeable are you about the history of	.20	.23	.56	.12	3.82	1.23
How much do you actually practice the traditions and keep the holidays	.24	.26	.55	.23	4.05	1.40
Factor 4: Food Consumption						
How often do you actually eat the food of	.13	.14	.13	.97	4.86	1.18
How much do you like the food of	.19	.14	.19	.45	5.54	0.85
AAMAS–Asian American						
Factor 1: Cultural Identity						
How much do you feel you have in common with people	.79	.03	.20	.12	3.86	1.35
How much do you identify with	.64	.01	.34	.17	3.21	1.66
How much do you interact and associate with people from	.58	.05	.19	.14	4.50	1.28
How much would you like to interact and associate with people from	.52	–.02	.12	.02	5.13	1.07
How proud are you to be a part of	.39	.08	.20	.16	3.66	1.78
How negative do you feel about people from[a]	–.20	–.04	.08	.00	2.13	1.11
Factor 2: Language						
How well do you understand the language of	.00	.91	.14	.10	1.30	0.77
How well do you speak the language of	–.02	.82	.12	–.07	1.28	0.77
How well do you read and write in the language of	.01	.70	.15	.02	1.15	0.48

TABLE 2 (*continued*)

Item	*Standardized factor loading* 1	2	3	4	*M*	*SD*
Factor 3: Cultural Knowledge						
How knowledgeable are you about the culture and traditions of	.23	.08	.70	.18	2.82	1.20
How much do you actually practice the traditions and keep the holidays	.10	.21	.52	.11	1.56	0.91
How often do you listen to music or look at movies and magazines from	.09	.10	.49	.00	1.67	1.05
How knowledgeable are you about the history of	.12	.06	.43	.23	2.78	1.21
Factor 4: Food Consumption						
How often do you actually eat the food of	.10	.04	.19	.85	3.91	1.24
How much do you like the food of	.16	−.02	.12	.56	5.03	1.11
AAMAS–European American						
Factor 1: Cultural Identity						
How much do you identify with	.75	.21	.11	.13	4.14	1.36
How much do you feel you have in common with people	.67	.10	.23	.16	3.99	1.25
How proud are you to be a part of	.57	−.02	.17	.21	4.23	1.52
How much do you interact and associate with people from	.45	.17	.16	.18	4.52	1.39
How much would you like to interact and associate with people from	.39	.00	.10	.34	5.06	1.18
How negative do you feel about people from[a]	−.37	−.02	.20	−.05	2.67	1.38
Factor 2: Language						
How well do you speak the language of	.09	.87	.20	.08	5.75	0.57
How well do you understand the language of	.08	.81	.13	.05	5.82	0.51
How well do you read and write in the language of	.14	.77	.12	.04	5.74	0.63
Factor 3: Cultural Knowledge						
How knowledgeable are you about the culture and traditions of	.17	.12	.66	.04	4.80	1.08
How knowledgeable are you about the history of	.02	.16	.66	.10	4.72	1.05
How much do you actually practice the traditions and keep the holidays	.34	.22	.39	.13	4.73	1.23
How often do you listen to music or look at movies and magazines from	.32	.25	.30	.14	5.58	0.84
Factor 4: Food Consumption						
How much do you like the food of	.21	.04	.01	.76	4.69	1.24
How often do you actually eat the food of	.21	.11	.14	.60	4.63	1.15

Note. AAMAS = Asian American Multidimensional Acculturation Scale.

[a]The statement is worded in a reverse direction. The score should be reverse.

ese, and 4 (3%) Vietnamese. In terms of generational status, there were 47 (34%) first generation (foreign-born), 67 (49%) second generation, 10 (7%) third generation, 12 (9%) fourth generation, and 2 (1%) fifth generation and above. The length of residence in the United States among first-generation participants ranged from 2 to 30 years, with a mean of 18.5 years (*SD* = 5.3).

QUESTIONNAIRE. For the purposes of this follow-up study, a questionnaire was prepared consisting of the AAMAS, the Asian Values Scale (AVS; Kim, Atkinson, & Yang, 1999), Rosenberg's Self-Esteem Scale (RSES; Rosenberg, 1968), and a demographic section. We discuss each of these briefly below.

The AVS measure contains 36 statements that assess adherence to various dimensions of Asian cultural values, including collectivism, conformity to norms, emotional self-control, family recognition through achievement, filial piety, and humility. The AVS uses a 7-point Likert type scale (1 = *strongly disagree*; 7 = *strongly agree*). Support of AVS's construct validity was obtained by identifying, via a nationwide survey, items that reflected cultural values commonly observed across various Asian American ethnic groups; items were retained that were more highly endorsed by first-generation Asian Americans than by European Americans. AVS's concurrent and divergent validity were obtained by comparing them with the Individualism–Collectivism Scale (Triandis, 1995) and the SL–ASIA (Suinn et al., 1987). Kim et al. (1999) reported internal consistency scores (coefficient alpha) of .81 and .82 and a 2-week test–retest reliability of .83; the data from the present study yielded a coefficient alpha of .86. For the present data analyses, average AVS scores ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) were used.

The 10-item RSES measure of self-esteem based on a 4-point Likert-type scale (1 = *strongly disagree,* 4 = *strongly agree*) has been widely used in psychological research. Rosenberg (1968) demonstrated convergent and divergent validity by reports of significant correlations with similar measures and other criterion-related variables, including peer group reputation, depression, and psychophysiological indicators. The RSES has a 2-week test–retest reliability coefficient of .85 (Silber & Tippett, 1965). The data in the present study yielded a coefficient alpha of .89. For the present data analyses, average RSES scores ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) were used. The RSES has been validated for use with Asian Americans and found to be cross-culturally valid (Ross, Xun, & Wilson, 2002; Yanico & Lu, 200).

PROCEDURE. After obtaining approval from the human subjects committee of the host university, participants were recruited from the psychology subject pool. Students enrolled in introductory psychology and other lower division undergraduate courses in psychology signed up to participate in this study for extra credit. Interested students showed up at a designated time and place to complete the survey. A trained research assistant distributed the survey, explained the general purpose of the study, and informed the students of their right to refuse to participate at any time without any penalty other than not receiving the extra credit.

Results

Means, standard deviations, and intercorrelations of the variables are presented in Table 3.

INTERNAL RELIABILITY. To further examine the AAMAS's reliability, we calculated coefficient alphas for the AAMAS–CO, AAMAS–AA, and AAMAS–EA. Consistent with Study 1, the results yielded coefficient alphas of .89, .83, and .81, respectively.

CRITERION-RELATED VALIDITY. Criterion-related validity was assessed by correlating the AAMAS scores with the participants' generation status. Consistent with the results of Study 1, a significant negative correlation was observed between AAMAS–CO and gen-

TABLE 3 Means, Standard Deviations, and Intercorrelations Among Variables

Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. AAMAS–CO	4.34	0.83	—					
2. AAMAS–AA	3.11	0.68	.52**	—				
3. AAMAS–EA	4.75	0.64	–.12	–.16*	—			
4. AVS	4.34	0.67	.37**	.18*	–.25**	—		
5. RSES	3.26	0.51	.10	.03	.17	–.07	—	
6. Generation	—	—	–.17*	–.12	.12	–.02	.17	—

Note. AAMAS = Asian American Multidimensional Acculturation Scale; CO = Culture of Origin; AA = Asian American; EA = European American; AVS = Asian Values Scale; RSES = Rosenberg Self-Esteem Scale. Generation = generation since immigration status (frequency is presented in the *Participants* section).

*$p < .05$. **$p < .01$.

eration status (–.17); also consistent with Study 1, the correlations between the other AAMAS scales and generational status were nonsignificant (see Table 3).

CONCURRENT VALIDITY. Concurrent validity was assessed by comparing AVS ratings with scores obtained for each of the three scales of the AAMAS. We expected a modest level of correlation between the AAMAS and the AVS based on the fact that, while both instruments assess adaptation to either culture of origin or the host cultures, the AAMAS items are predominantly behavior oriented whereas the AVS items are values oriented. We also expected an inverse relationship between the AVS and AAMAS–EA because the former measures degree of adherence to Asian culture of origin whereas the latter measures acculturation to host culture. Coefficients for the correlations between the AVS and the AAMAS–CO, AAMAS–AA, and AAMAS–EA were .37, .18, and –.25, respectively.

DIVERGENT VALIDITY. To examine AAMAS's divergent validity, we compared scores between the AAMAS and RSES. We expected a near-zero correlation between these instruments because AAMAS scales assess acculturation and RSES measures self-esteem. As expected, the results yielded nonsignificant coefficients of .10, .03, and .17 for the correlations between the RSES and the AAMAS–CO, AAMAS–AA, and AAMAS–EA, respectively.

CONFIRMATORY FACTOR ANALYSIS. On the basis of the results of the exploratory factor analysis reported in Study 1, confirmatory factor analysis was conducted for each AAMAS scale to further study its construct validity. Each confirmatory analysis tested the validity of a factor structure derived from the results of the exploratory analysis. The factor structure for the three AAMAS scales comprised four correlated latent variables, with the variables representing Cultural Identity, Language, Cultural Knowledge, and Food Consumption. For AAMAS–CO, each latent variable consisted of 6, 4, 3, and 2 indicators, respectively. For AAMAS–AA and AAMAS–EA, each latent variable consisted of 6, 3, 4, and 2 indicators, respectively.

For AAMAS–CO, the results yielded a chi-square of 188.67 and degrees of freedom of 84. The results also yielded the following fit indices (see Schumacker & Lomax, 1996): comparative fit index (CFI) = .980, Bentler–Bonett normed fit index (NFI) = .964, Bentler–Bonett nonnormed fit index (NNFI; also known as Tucker–Lewis Index) = .971, incremental fit index (IFI) = .980, and relative fit index (RFI) = .949. The results for AAMAS–AA yielded a chi-square of 177.73 and degrees of freedom of 84. The results yielded the following fit indices: CFI = .976, NFI = .956, NNFI = .966, IFI = .976,

and RFI = .938. For AAMAS–EA, the results yielded a chi-square of 134.95 and degrees of freedom of 84. The results yielded the following fit indices: CFI = .991, NFI = .978, NNFI = .988, IFI = .991, and RFI = .968. These results indicate that the correlated four-factor model for the AAMAS–CO, AAMAS–AA, and AAMAS–EA represents a very good fit to the data, providing further support for the construct validity of the AAMAS scales.

To further examine the reliability of the four factors underlying each of the AAMAS scales, we calculated coefficient alphas. For the AAMAS–CO, obtained coefficient alphas for Cultural Identity, Language, Cultural Knowledge, and Food Consumption were .79, .84, .77, and .71, respectively. For the AAMAS–AA, coefficient alphas were .70, .85, .77, and .79, respectively. Finally, for the AAMAS–EA, coefficient alphas were .78, .82, .71, and .71, respectively.

Study 3: Test–Retest Reliability and Confirmation of Internal Consistency

Method

PARTICIPANTS. Participants were 44 (25 men, 19 women) Korean Americans residing in Southern California. They ranged in age from 21 to 32 years, with a mean of 26.8 (*SD* = 3.0). Half of the participants were born in Korea (first generation); the other half reported second-generational status. The length of residence in the United States among first-generation participants ranged from 2 to 29 years, with a mean of 18.4 years (*SD* = 7.6).

QUESTIONNAIRE. The questionnaire prepared for this study included only the AAMAS and a demographic section, as the purposes of the investigation were restricted to the assessment of test–retest reliability and further examination of internal consistency.

PROCEDURE. Participants were recruited from two Korean American religious organizations in southern California whose members were invited to participate in "a study examining the adaptation experiences of Asian Americans." In accordance with an approved petition to the IRB of research from the host university, they were informed that participation was completely voluntary and, if they chose to participate, their responses would remain anonymous. The questionnaire was then administered to volunteer participants. Two weeks later, the questionnaire was readministered to the same participants. Of the original 58 participants, 44 individuals completed the second administration.

Results

INTERNAL RELIABILITY. Coefficient alphas were computed for each of the three AAMAS scales for both administrations. For the first and second administration, respectively, the results indicated coefficient alphas of .89 and 91 for AAMAS–CO, .83 and 83 for AAMAS–AA, and .76 and 81 for AAMAS–EA.

TEST–RETEST RELIABILITY. A 2-week coefficient of stability was computed for each of the three AAMAS scales. The results indicated coefficients of .89 for AAMAS–CO, .75 for AAMAS–AA, and .78 for AAMAS–EA.

Discussion

The three studies described in this article provide strong and ample evidence of the AAMAS's reliability and validity. Internal consistency and test–retest coefficients for the three subscales of AAMAS–CO, AAMAS–AA, and AAMAS–EA were well within acceptable to preferable range of reliability. The alpha coefficients were consistent across four separate administrations, ranging from .87 to .91 for AAMAS–CO, .78 to .83 for AAMAS–AA, and .76 to .81 for AAMAS–EA. Of the three scales, the AAMAS–CO was most reliable. Evidence of

criterion-related validity was observed in the expected pattern of correlations between AAMAS–CO and generational status. Increase in generational status was associated with diminished adherence to culture of origin. However, generational status was unrelated to the Asian American and European American cultural dimensions. This is consistent with Cuellar, Nyberg, Maldonado and Roberts's (1997) findings using the Acculturation Rating Scale for Mexican Americans II (ARSMA II), the orthogonally adapted version of the ARSMA I. They found that Mexican orientation was related to generation but not to European American orientation.

In terms of concurrent validity, as expected, there was a strong inverse correlation between the AAMAS–CO with the unidimensional SL–ASIA, and a significant positive correlation with AVS score (higher scores on the SL–ASIA indicate higher acculturation to Western culture; higher scores on the AVS indicate higher adherence to Asian values). The inverse pattern of correlations was obtained for the AAMAS–EA: It was positively correlated with the SL–ASIA and negatively correlated with the AVS. Correlations with the bidimensional CIS provided a more compelling evidence of concurrent validity for the AAMAS as well as the notion that acculturation to host culture and Asian culture of origin are not uniform processes. The patterns of relationships were in the expected direction with a positive correlation between the AAMAS–CO and the CIS–Origin, and a negative correlation with the CIS–Anglo. The correlation between AAMAS–EA and CIS–Anglo was positive; however, the relationship between AAMAS–EA and CIS–Origin was nonsignificant. Thus, it appears that although adherence to the culture of origin comes at the expense of acculturation to European American culture, the reverse is not true; adherence to European American culture does not come at the expense of the culture of origin. These results are similar to the findings of Tsai et al. (2000) that the Chinese and American cultural dimensions are inversely related for recent immigrants but unrelated for the native-born Chinese Americans. Similarly, Ruelas, Atkinson, and Ramos-Sanchez (1998) found that loss of Mexican culture, but not the acquisition of Anglo culture, was related to lower perceptions of counselor credibility among Mexican Americans. These finding suggest that acculturation to host culture and Asian culture of origin are independent processes and should be measured as such.

Evidence of divergent validity for the AAMAS was reflected in the lack of a strong relationship to both the RSES and the ICI. This was to be expected given that these instruments assessed different constructs. The AAMAS was unrelated to the RSES, but, with the ICI, there was a small but statistically significant relationship. The strongest relationship was between the AAMAS–CO with the ICI subscales (ranging from .12 to .21 for the total and subscale scores), which suggests that, to a small extent, adherence to the culture of origin is associated with greater intergenerational conflict for Asian American college students. Acculturation to the European American culture was related to lower intergenerational conflict over dating and marriage issues but unrelated to the other subscales of family expectations and education and career. This pattern of findings support Chung's (2001) study and further confirm that acculturation is a complex process with each cultural dimension having a differentiated pattern of relationships to specific types of intergenerational conflict.

Because the pan-ethnic cultural dimension has not been examined previously, it was difficult to anticipate the specific nature of its relationship to the various measures used in the studies to validate the AAMAS. On the one hand, the development of a pan-ethnic identification requires a certain length of residence in the United States to foster a sense of connectedness and commonality of experience with other Asian ethnicities within the context of the host nation. On the other hand, a pan-ethnic Asian American identity is predicated on some degree of common cultural base that is derived

from the cultures of Asian origin or similarity of experience in the United States. Therefore, it was hypothesized that the pattern of correlations between the AAMAS–AA and the different measures would resemble those of AAMAS–CO but to a lesser extent. The results confirmed this.

The combined evidence of the exploratory and confirmatory factor analyses with the alpha coefficients suggests that the four-factor structure within each of the AAMAS cultural dimensions is reliable and valid. In contrast, although multiple factor structures for the SL–ASIA have been explored, there is no available psychometric data establishing reliability, leading to ambiguity about any underlying factor structure (Ponterotto et al., 1998). That the AAMAS has a clear four-factor structure clustered around cultural identity, language, cultural knowledge, and food consumption is another example of the strength of this measure.

Although the AAMAS is built on advancements in conceptualization and measurement of acculturation, this study has several weaknesses. Because the items for the AAMAS were adapted largely from the SL–ASIA, one of its limitations was also inherited, namely that the items reflect a comingling of behavioral acculturation with cultural identity. This reflects a lack of a clear and consistent conceptual distinction that has existed in the past. Phinney's (2002) analysis of the distinctions between the two will hopefully lead to greater clarity and consistency in the measurement of these related constructs. However, this may continue to be a challenge because the psychometric data may not always support the conceptual distinctions as was the case in our study, in which factor analysis failed to identify cultural identity as being distinct from acculturation. Another limitation of this study is the restricted age range of the participants. Future studies need to be conducted on a wider spectrum of age and acculturation to further validate the AAMAS, a recommendation that applies to acculturation research with Asian Americans in general.

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