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An Empirical Comparison of Acculturation Models

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The unidirectional and bidirectional models of acculturation were compared in a sample of 291 Asian Americans. Both models produced good predictions of Asian preferences, cultural knowledge, ethnic identification, and generational status. The bidirectional model, however, failed to demonstrate its reputed independence across home culture and host culture orientations. The unidirectional model is recommended as an economical proxy measure of acculturation, the bidirectional model is recommended for full theoretical investigations of acculturation, and a speculative tridirectional model is proposed to clarify the distinction between acculturation and ethnogenesis (the creation of a new ethnicity).

The two most common models of acculturation theory are the unidirectional model (UDM) and the bidirectional model (BDM) of acculturation. Under both models, psychological acculturation (Graves, 1967) is defined as the process of adapting to a new culture. Although there are many conceptual comparisons of these models (Berry, Trimble, & Olmedo, 1986; Keefe & Padilla, 1987; Phinney, 1992), there are few empirical comparisons of the models. This article is designed to benchmark the empirical distinctions between the UDM and the BDM and to investigate whether those empirical distinctions conform to theory.

Conceptual Distinctions Between the UDM and BDM

Since Parks and Miller (1921), the unidirectional model of acculturation has been the standard view of acculturation. The UDM describes acculturation as the shedding off of an old culture and the taking on of a new culture. In recent years, the UDM has been called “unilinear” because it describes only one outcome of acculturation—assimilation. In Figure 1, the unidirec-

tional model is presented in simple form, as a single line with a unidirectional arrow.

Proponents of the UDM (Gans, 1979; Gordon, 1964) posit that assimilation takes place in many layers and stages (linguistic, social, economic, legislative, etc.). In Figure 2, the UDM is presented in a more elaborate form. This second presentation displays the stage-like nature of the UDM (Gordon, 1964; Triandis, Kashima, Hui, & Lisansky, 1982). This second presentation underscores a fact about the UDM that is frequently overlooked. The UDM is multidimensional in the sense that it involves many topics or factors (Taylor, 1991) even though the UDM is not multidimensional in terms of its directions or possible outcomes.

Last, we note that many researchers describe the UDM as bipolar. As Trimble (1989) states, “Psychologists usually attempt to isolate an individual’s cultural orientation on a bipolar linear continuum . . . an individual is placed somewhere between a traditionalist pole to a fully acculturated position” (p. 174). Regardless of whether the UDM is viewed as unipolar or bipolar, the overriding

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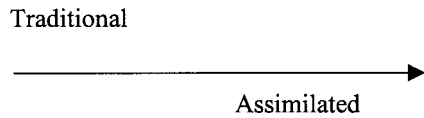


Figure 1 Simple version of the unidirectional model (UDM) of acculturation.

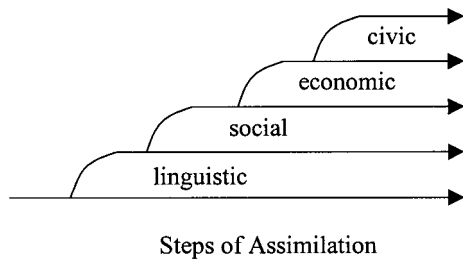


Figure 2 Elaborate version of the unidirectional model (UDM) of acculturation.

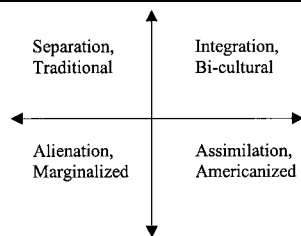


Figure 3 Bidirectional model (BDM) of acculturation.

question of the UDM is the same: “How far has someone progressed (or regressed) on the assimilation pathway?”

Throughout the past two decades, the bidimensional or bidirectional model of acculturation (BDM) has become a popular alternative to the UDM. Proponents of the BDM describe acculturation in terms of two cultural orientations: one’s relation to a home culture (a culture of origin) and one’s relation to a host culture (a new, second culture). The BDM claims that these orientations are conceptually independent, making it possible to outline four types of acculturation. One influential version of the BDM (Berry, Trimble, & Olmeda, 1986) describes these four types as separation (positive home culture attitudes coupled with negative host culture attitudes), assimilation (negative home culture attitudes coupled with positive host culture attitudes), marginalization (negative attitudes toward both cul-

tures), and integration (positive attitudes toward both cultures). Figure 3 depicts these four types. Figure 3 also shows alternative labels for each type. Integrationism, for example, is sometimes called biculturalism or alternation.

Similar to proponents of the UDM, proponents of the BDM believe that acculturation involves many topics or factors; for example, linguistic, economic, social, and so forth. However, proponents of the BDM believe that home and host orientations must be measured independently (Berry et al., 1989; Cuellar, Arnold, & Maldonado, 1995). As such, each factor in the BDM exists on two dimensions (or directions): a horizontal axis regarding one’s host culture and a vertical axis regarding one’s home culture.

Overall, proponents of the BDM criticize the UDM for forcing an inverse relationship between two dimensions that they view as orthogonal (Oetting & Beauvais, 1991). Proponents of the BDM describe the unidirectional model as woefully simple, if not misleading, because it accounts for only one type of acculturation. Proponents of the UDM counter that the long-term, inevitable impact of culture contact is mostly assimilative (Gans, 1979; Gordon, 1964). Proponents of the UDM believe that their model captures the largest trend (and variance) in acculturation phenomena, doing so with a parsimony that eludes the BDM.

To turn these claims and counterclaims into empirical questions, we measured both models simultaneously. We compared the models on their internal, psychometric properties and on their external, criterion validity. In sum, we provide an empirical framework for making comparative claims about acculturation models.

METHOD

Sample

Self-report and test data were collected from 291 Asian and Asian American students at a large California university. Participants were required to have at least 50% Asian heritage via bloodline. Of the participants, 58% were female, and 68% were first-generation immigrants. The ethnicity and generational status of the sample is reported in Table 1.

Psychological Acculturation Measures

Two acculturation inventories were administered. These inventories differed in their underlying models of acculturation, yet they were comparable in their topical coverage.

The Suinn-Lew Asian Self-Identity Acculturation Scale (SLS-U) covers numerous domains of acculturation: language, peer relations, food and media prefer-

TABLE 1: Frequency of Participants by Asian American Ethnicity and Generational Status

Ethnic Group	Immigrant Generational Status Codes				
	1.0	1.5	2.0	2.5	n
Chinese American	25	27	12	7	71
Filipino American	12	11	26	1	49
Korean American	13	12	10	0	35
Vietnamese American	28	32	7	0	67
Other Asian American	19	18	22	10	69
Total	97	99	77	18	291

NOTE: Generational status codes are 1.0 = lived less than 60% of one’s life in United States, 1.5 = lived more than 60% of one’s life in United States, 2.0 = self and one parent born in United States, and 2.5 = self and both parents born in United States.

ences, preferred ethnic label, and generational status. The SLS-U is multidimensional in the factor analytic sense of the term (Suinn, Ahuna, & Khoo, 1992). However, the SLS-U does not operationalize home and host orientations separately. The SLS-U has a question, for example, that asks, “In which language do you read/write?” The five response options to this question are as follows: (a) only an Asian language, (b) an Asian language better than English, (c) both equally well, (d) English better than an Asian language, and (e) only English. These response options assume a trade-off between home and host orientations. As such, the SLS-U has been described as a unilinear measure of acculturation (see Nagata, 1994; Ryder, Alden, & Paulhus, 2000; Sayegh & Lasry, 1993). The SLS-U is the most widely used measure of Asian American acculturation (Atkinson & Gim, 1989; Leong & Tata, 1990). The 21 items of the original SLS-U often are combined as a global acculturation index.

The Asian American Acculturation Inventory (AAI) was designed to measure the BDM (Flannery, 1996). The AAI has nine subscales that cover four broad areas: language (ability and frequency), social relationships (childhood pals, current friendships, dating partners, club membership), customs and heritage (self-rated knowledge), and behavioral markers (food and media selection). AAI subscales are assessed bidimensionally, that is, with separate home and host culture questions. For example, the AAI contains two questions about cursive language abilities: “How well do you read and write in your Asian language?” and “How well do you read and write in English?” These two items differ only in their cultural referents. Otherwise, the items have identical response options, ranging from *perfect literacy* to *no literacy at all*. Here, it is important to note that answers on the first question do not force answers on the second question. In this study, the Asian-focused subscales were combined to create a general index of Asian orientation. That index was abbreviated as AAI-A, where “-A” signi-

fies the Asian orientation of the index. Likewise, the Western focused subscales were combined to create AAI-E, where “-E” signifies the English language (or Eurocentric) orientation of that index.

Comparability of the acculturation inventories. The SLS-U, the AAI-A, and the AAI-E cover the same topics of acculturation, providing realistic comparisons at the scale level. At the item level (of individual questions), the inventories often used similar phraseology. In particular, the items for spoken language ability, cursive language ability, and music selection had almost identical phrasing for all three scales.

External Measures

To compare the UDM and the BDM, a battery of seven criteria measures was administered. The seven measures are described in the order that they were administered.

Participants completed three personality inventories: the Schwartz Values Survey (57 items), the NEO (60 items), and Cohen’s Perceived Stress Scale (14 items). The Schwartz Value Survey (SVS) (Schwartz, 1994) measures the importance that people place on 10 universal values: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism. Some of these values have been implicated in cultural differences between Asian and Western cultures. In particular, the conformity and tradition subscales are thought to be measures of collectivism, whereas the self-direction and stimulation subscales are measures of individualism (Schwartz, 1994). The NEO measures the “Big Five” personality traits of Neuroticism, Extroversion, Openness to Experience, Agreeableness, and Conscientiousness (Costa & McCrae, 1992). The traits of Extroversion and Openness have differential manifestation in Asian versus Western cultures (Luk & Bond, 1993). Cohen’s Perceived Stress Scale indexes the stress that participants “subjectively feel” in their daily lives (Cohen, Kamarck, & Mermelsein, 1993). Potentially, this scale may tap acculturative stress (Moyerham & Forman, 1992).

Flannery’s Listing Protocol (FLIP) was composed of seven preference-listing tasks. Participants were requested to list their favorite foods, musicians, friends, coworkers, romantic partners, clubs, and cultures. After listing their favorites (three per category), participants described the ethnicity of their favorites. For example, if “My mom’s rice” were listed as a favorite food, a participant might describe it as Chinese, as Mexican, or if appropriate, as nonethnic. Participants were asked to use their own preferred ethnicity labels. Next, the participants’ ethnicity descriptions (labels) were coded by the researcher as either Asian or non-Asian. Last, codes from all seven categories were combined to create a global Asian preference score. Because participants listed their

favorites in concrete terms (by writing down the exact identity of each favorite), it is believed that FLIP preference scores were more objective than most self-report measures about preferences. Moreover, because participants did not know that they would later describe the ethnicity of their favorites, it is believed that the FLIP preference scores were more subtle than most measures of cultural preferences (Flannery, 1998).

Next, participants completed a background survey. This survey contained 18 self-report items, covering topics of age, gender, and academic achievement (Scholastic Aptitude Test [SAT] scores, college grade point average [GPA]). Some background questions measured the conventional levels of generational status (first- vs. second-generation immigrant status). In fact, some of the background questions (e.g., age upon immigration) were sensitive enough to subdivide generation levels; for example, 1.0 vs. 1.5 and 2.0 vs. 2.5 generational status (see Table 1). These fractional levels retain the logic of the conventional generational-status variable (see Keefe & Padilla, 1987).

At this juncture, participants completed the acculturation scales (the SLS-U and the AAI as described above). After the acculturation scales, participants completed the Ethnic Identity Scale. Patterned after Phinney's (1992) ethnicity scales, the Ethnic Identity Scale measures ethnic identification, ethnic belonging, and ethnic appearance. Items include the following: "I feel a strong attachment toward my ethnic group" and "I feel comfortable being physically distinguished as Asian or Asian American." The reliability ($\alpha = .88$) and validity of the Ethnic Identity Scale are discussed elsewhere (Flannery, 1996).

Last, respondents were tested on their cultural knowledge. The cultural knowledge quiz was composed of 46 objective questions. Using various formats (e.g., fill in the blank, multiple choice, matching), participants were asked to demonstrate their knowledge of Asian geography, traditions, politics, languages, and so forth. Half of the questions were culture-specific. That is, questions were tailored for specific Asian groups; for example, Chinese American participants received a Chinese version of the cultural knowledge quiz, Korean Americans received a Korean version of the cultural knowledge quiz, and so forth. After questions were standardized within their appropriate reference groups, a global index of "cultural knowledge" was made from all 46 questions.

In total, the seven external measures contained 25 indices. In this report, the 25 indices are grouped into three categories: definitive predictive criteria, potential predictive criteria, and definitive discriminant criteria. Constructs that should associate with acculturation (e.g., cultural knowledge, Asian preferences, generational sta-

tus, and ethnic identity) were grouped as definitive criteria for the acculturation scales (Suinn, Rickard-Figueroa, Lew, & Vigil, 1987). Constructs that might associate with acculturation (e.g., extroversion, perceived stress, SAT scores) were grouped as potential criteria. Constructs that were expected not to associate with acculturation (e.g., age, gender, GPA) were grouped as discriminant criteria.

Analysis Strategy

Reliability estimates (coefficient alphas) were calculated for the acculturation scales. Next, correlations among the three acculturation scales (SLS-U, AAI-A, and AAI-E) were calculated. These correlations were calculated for two reasons: to assess the convergent validity among the acculturation scales and to test the reputed orthogonality of the BDM. Convergent validity was assessed with r_{UA} (the correlation between SLS-U and AAI-A) as well as r_{UE} (the correlation between the SLS-U and the AAI-E). The orthogonality of the BDM was assessed with r_{AE} , the correlation between the AAI-A and AAI-E scales. The above correlations also were calculated at the item level.

Next, the acculturation scales were used as predictors in a series of regression models. The criteria in these analyses were the 25 indices described above (cultural knowledge, Asian preferences, etc.). The analyses were performed to determine which acculturation model was the best predictor of acculturation. This critical issue was addressed in four ways.

First, the question of model superiority was addressed with Pearson correlations: Which acculturation scale had the strongest correlations with relevant criteria? Second, model superiority was addressed by asking whether the UDM scale could (by itself) surpass the predictive ability of the two BDM scales: Would the r^2 value of SLS-U surpass the R^2 value of the two AAI-A and AAI-E scales? Third, to deal with the disparity of pitting a one-predictor model against a two-predictor model, superiority was addressed by comparing all possible two-predictor regression models: Would the R^2 of the two BDM predictors surpass the R^2 of other possible two-predictor models? For example, would the R^2 of AAI-A and AAI-E surpass the R^2 of SLS-U and AAI-A? Fourth, the question of model superiority was addressed in terms of uniquely explained variance: Which acculturation scale explained the most unique (nonredundant) variance in the criteria? This last question was addressed with squared semipartial correlations.

Squared semipartial correlations (spR^2 's) index the amount of variance that is uniquely explained by a predictor (Cohen & Cohen, 1983). Simply put, spR^2 's demonstrate whether an acculturation scale "taps into" a new part of a criterion. In this study, spR^2 was calculated by

subtracting the R^2 of a nested two-predictor model from the R^2 of an omnibus three-predictor model. The difference between the two- and three-predictor models (ΔR^2) defines the $\text{sp}R^2$ of the additional predictor. In mathematical terms,

$$(R^2 \text{ of A, B, and C}) - (R^2 \text{ of A and B}) = \Delta R^2 = \text{sp}R^2 \text{ of C,} \quad (1)$$

where A, B, and C represent the acculturation scales. Equation 1 shows that $\text{sp}R^2$ is the incremental variance that gets explained when going from a two-predictor model to a three-predictor model. To date, only a few researchers have empirically compared the UDM and BDM in the same study (e.g., Ryder, Alden, & Paulhus, 2000; Tsai, Ying, & Lee, 2000). Here, we raise the bar even higher by comparing the UDM and BDM in the same equation. This allows us to identify the common overlap in the models' predictive abilities and then directly compare the models' remaining, unique abilities.

RESULTS

Table 2 presents the reliability estimates for SLS-U, AAI-A, and AAI-E. All three acculturation scales demonstrated reliabilities (coefficient alpha) greater than .70. Table 2 also displays the correlations among the acculturation scales. The correlation between SLS-U (the unidirectional scale) and AAI-A (the Asian-focused scale) was $r_{UA} = -.69$. This correlation was negative because the Asian pole of the SLS-U was keyed low. The correlation between SLS-U and AAI-E (the Euro-focused scale) was similar in magnitude, $r_{UE} = .66$. More important, Table 2 addresses the orthogonality of the BDM. The correlation between the Asian-focused and the Euro-focused scales was $r_{AE} = -.55$.

Table 3 addresses similar issues of convergence and orthogonality at the item (question) level. The convergence correlations between unidirectional items (from the SLS-U) and their corresponding Asian-focused items (from the AAI-A scale) all were negative, ranging in magnitude from $-.45$ to $-.74$ (see r_{UA} in the second column). The largest correlation was found in the domain of reading/writing. Correlations between unidirectional items and their matching English-focused items all were positive, ranging in magnitude from $.40$ to $.63$ (see r_{UE} in the third column). Here, the highest item-level correlation was found in music items.

The last column of Table 3 addresses the issue of BDM orthogonality. The item-level correlations between matched Asian-focused and English-focused items (r_{AE}) all were negative, ranging in magnitude from $-.21$ (spoken-language ability) to $-.36$ (cursive-language ability) to $-.45$ (music selection). When these items were combined to make a three-item Asian scale and a three-

item English scale, respectively, those scales were found to correlate, $r_{AE} = -.41$. Corrected for attenuation, this correlation was $r_{AE} = -.61$.

Table 4 presents information about the external validity of the acculturation scales. Column two displays the correlations between the SLS-U and 14 external indices. Columns three and four display the correlations of AAI-A and AAI-E with the same 14 indices. The SLS-U scale correlated greater than $|.40|$ with three validation criteria: Asian preferences, cultural knowledge, and generational status. The Asian-focused scale (AAI-A) correlated greater than $|.40|$ with Asian preferences, cultural knowledge, and ethnic identification. The Euro-focused scale (AAI-E) correlated greater than $|.40|$ with Asian preferences, generational status, and verbal SAT scores.

Focusing on the rows of Table 4, Asian preferences (as measured by FLIP) had the strongest correlations with the acculturation scales. Generational status had the second strongest correlations. Table 4 displays every index that had a significant correlation with one or more acculturation scales. Given the sample size, all correlations greater than $|.14|$ were significant at $\alpha = .01$. For discriminant validity purposes, Table 4 also displays three indices that failed to correlate greater than $|.14|$ with the acculturation scales; namely, parent's income, college GPA, and gender. Otherwise, if an index is not shown in Table 4, it failed to correlate significantly with any acculturation scales. Three (of the 5) NEO personality scales and 8 (of the 10) SVS values scales failed to correlate significantly with any of the acculturation scales.

Table 4 also addresses the issue of model superiority. As noted, all three acculturation scales performed about equally well as predictors (i.e., bivariate correlations) of the external variables. There were, however, a few exceptions to this parity. The SLS-U was a superior predictor of generational status. The AAI-A was a superior predictor of ethnic identification and SVS traditionalism. The AAI-E was a superior predictor of NEO openness to experience, SAT verbal scores, and perceived stress. These predictive advantages (stronger correlations) were statistically significant when tested as dependent correlations (see Cohen & Cohen, 1983, p. 57). In the last two columns of Table 4, the question of model superiority was addressed in a second fashion: the two scales of the BDM were compared against the one UDM scale; that is, the R^2 of AAI-A and AAI-E was compared with the r^2 of SLS-U. Not surprisingly, the two-predictor BDM outperformed the one-predictor UDM on several criteria. The next analysis deals with the disparity of pitting a one-predictor model against a two-predictor model.

Table 5 displays R^2 s for all possible two-predictor regression models. Specifically, the R^2 of AAI-A and AAI-E (the BDM scales in column 5) was compared with the R^2 of AAI-A and SLS-U (a hybrid combination of scales in

TABLE 2: Descriptions, Intercorrelations, and Reliabilities of Three Acculturation Scales

Scale Title	Scale Composition	Correlations (Reliabilities)		
		Unidirectional Model Scale (SLS-U)	Bidirectional Model Scales	
			Asian American Focus (AAI-A)	Euro-American Focus (AAI-E)
SLS-U	12 unilinear, 4 Asian focused, and 5 nonclassifiable items	1.00 (.84)		
AAI-A	24 Asian-focused items	-.69	1.00 (.76)	
AAI-E	14 Euro-focused items	.66	-.55	1.00 (.73)

NOTE: SLS-U = Suinn-Lew Asian Self-Identity Acculturation Scale; AAI = Asian American Acculturation Inventory.

TABLE 3: Correlations Among Matching Unilinear (U), Asian-Focused (A), and Euro-Focused (E) Acculturation Items

Content Domain	r_{UA}	r_{UE}	r_{AE}
Spoken language ability	-.45	.40	-.21
Reading/writing ability	-.74	.41	-.36
Music selection	-.73	.63	-.45

NOTE: r_{UA} represents correlations between unilinear items and matching Asian-focused items, r_{UE} represents correlations between unilinear items and matching Euro-focused items, and r_{AE} represents correlations between Asian-focused items and matching Euro-focused items.

column 3) and the R^2 of AAI-E and SLS-U (another hybrid combination of scales in column 4). Overall, no pair of scales consistently outperformed the other pairs of scales. For this reason, Table 5 also addressed the question of model superiority by using spR^2 s.

SpR^2 s were used to investigate which acculturation scale predicted the most unique variance in acculturative criteria (see columns 6, 7, and 8 in Table 5). The spR^2 s were calculated by subtracting the R^2 s of nested two-predictor models (in columns 3, 4, and 5) from the R^2 s of the omnibus three-predictor models in column 2. For example, .073 of the variance in Asian preferences was uniquely explained by the AAI-A (e.g., $.420 - .346 = .073$). In terms of spR^2 s, .073 is a lot of variance to explain single-handedly, especially when other variables had "first crack" at explaining the criterion.

In Table 5, all spR^2 s greater than .02 were statistically significant. Using this cut-off, the SLS-U was found to have unique ability to explain variance in generational status. The AAI-A explained unique variance in Asian preferences, ethnic identification, SVS traditionalism, and SAT math scores. The AAI-E explained unique variance in SAT verbal scores.

General psychometric results. Both the SLS and the AAI demonstrated sufficient internal consistency (alpha coefficients greater than .70) to warrant further use and

development. Moreover, the scales demonstrated promising signs of convergent validity; for example, $r = -.69$ between SLS-U and AAI-A, and $r = .66$ between SLS-U and AAI-E. More important, the acculturation scales correlated nicely with external validity criteria. For example, two acculturation scales correlated higher than $|.40|$ with the cultural knowledge tests, and two acculturation scales correlated higher than $|.50|$ with Asian preferences. The acculturation scales also discriminated nicely against sex, income, GPA, and most personality traits. Although a few correlations were slightly higher (e.g., age and SLS-U, $r = .25$) or slightly lower (e.g., stress and SLS-U, $r = .05$) than might be expected, the overall validity of the acculturation scales was impressive.

DISCUSSION

Orthogonality of the BDM

In this study, the correlation between home and host orientations was substantial: $r = -.55$ between the AAI-A and the AAI-E. Substantial correlations between home and host orientations also were found at the item level. Proponents of the UDM are free to claim that these correlations, being greater than zero, disprove the orthogonality assumption of the BDM. In response, proponents of the BDM have argued that these correlations, being less than 1.00, "account for only $|.30|$ percent of the variance rather than 100% as the bipolar [UDM] model would assume" (Nguyen, Messe, & Stollak, 1999, p. 22). Unfortunately, both arguments are too extreme. Instead, we evaluate our findings from three broad perspectives: a methodological interpretation, a sociopolitical theory, and a tridirectional model of ethnogenesis.

Methodological interpretation. Evaluating the BDM on its statistical orthogonality involves the assumption that conceptual independence requires statistical independence (orthogonality). Although this is usually a safe assumption, there are times when conceptual independence does not require statistical independence. Height

TABLE 4: Correlations Between Acculturation Scales and External Criteria

	<i>Bivariate Correlations</i>			<i>UDM r² Versus BDM R²</i>	
	<i>UDM (SLS-U)</i>	<i>Asian Focus (AAI-A)</i>	<i>Euro-Focus (AAI-E)</i>	<i>One-Predictor (SLS-U)</i>	<i>Two-Predictor (AAI-A, AAI-E)</i>
Definitive predictive criteria					
FLIP Asian preferences	-.57	.60	-.50	.325	.458
Cultural knowledge	-.47	.44	-.38	.221	.238
Generational status	.58	-.35	.51	.336	.301
Ethnic identification	-.28	.44*	-.09	.078	.217
Potential predictive criteria					
SVS self-direction	.17	-.22	.09	.029	.042
SVS tradition	-.17	.34*	-.13	.029	.094
NEO extraversion	-.01	.16	.15	.000	.090
NEO openness	.21	-.11	.28	.044	.135
SAT verbal	.32	-.16	.40	.102	.221
SAT math	-.10	.14	-.08	.010	.058
Stress	-.05	.03	-.15*	.003	.027
Definitive discriminant criteria					
Age	-.21	.02	-.12	.044	.020
Sex	.03	.05	.03	.000	.006
Income	.12	-.05	.19	.014	.080
College GPA	.04	-.08	.12	.002	.009

NOTE: SLS-U = Suinn-Lew Asian Self-Identity Acculturation Scale; AAI-A = Asian American Acculturation Inventory, the Asian scale; AAI-E = Asian American Acculturation Inventory, the English scale; FLIP = Flannery’s Listing Protocol for preference assessment; SVS = Schwartz Value Survey; NEO = Revised NEO Personality Inventory; SAT = Scholastic Aptitude Test; and GPA = grade point average. All correlations greater than |.14| were statistically significant at $p < .01$.

*Correlation is statistically larger, $p < .05$, than the next highest dependent correlation.

TABLE 5: Squared Multiple and Squared Semipartial Correlations

	<i>R² for Full Three-Predictor Model</i>			<i>R² for Two-Predictor Models</i>			<i>SpR² From Three-Predictor Model</i>	
	<i>SLS-U</i>	<i>SLS-U and AAI-A</i>	<i>SLS-U and AAI-E</i>	<i>AAI-A and AAI-E</i>	<i>SLS-U</i>	<i>AAI-A</i>	<i>AAI-E</i>	
Definitive predictive criteria								
FLIP Asian preferences	.420	.403	.346	.407	.012	.073*	.016	
Cultural knowledge	.249	.246	.228	.223	.025*	.020	.003	
Generational status	.372	.341	.361	.264	.107*	.010	.030*	
Ethnic identification	.230	.198	.092	.228	.002	.137*	.031*	
Potential predictive criteria								
SVS self-direction	.050	.048	.025	.049	.000	.025*	.002	
SVS tradition	.126	.125	.032	.122	.003	.093*	.000	
NEO extraversion	.105	.051	.038	.104	.001	.067*	.053*	
NEO openness	.091	.056	.082	.082	.009	.009	.035*	
SAT verbal	.184	.113	.161	.165	.018	.023	.071*	
SAT math	.020	.020	.009	.020	.000	.010*	.000	
Stress	.028	.005	.026	.027	.000	.001	.022	
Definitive discriminant criteria								
Age	.069	.068	.039	.019	.049*	.029*	.000	
Sex	.013	.012	.001	.008	.005	.012	.000	
Income	.042	.021	.035	.039	.002	.007	.020	
College GPA	.024	.007	.020	.015	.008	.003	.016	

NOTE: SLS-U = Suinn-Lew Asian Self-Identity Acculturation Scale; AAI-A = Asian American Acculturation Inventory, the Asian scale; AAI-E = Asian American Acculturation Inventory, the English scale; FLIP = Flannery’s Listing Protocol for preference assessment; SVS = Schwartz Value Survey; NEO = Revised NEO Personality Inventory; SAT = Scholastic Aptitude Test; and GPA = grade point average. SpR² = squared semipartial correlations. All R²s greater than .07 were statistically significant at $p < .01$.

*spR² is significant at $p < .05$.

and weight, for example, are distinct constructs even though they are highly correlated. Perhaps Asian-focused and Euro-focused scales are conceptually independent even though they are statistically correlated.

However, people can visually see the difference between height and weight. Height and weight are tangible, overt constructs. In contrast, cultural orientations are intangible, hypothetical constructs. In psychology, hypothetical constructs are usually validated by using the principle of covariation (Tellegan, 1991). In acculturation research, acculturation scales seldom correlate greater than $|.50|$ with external criteria. Citing such correlations as evidence of external validity, while dismissing even stronger correlations between home and host orientations, remains problematic.

Sociopolitical interpretation. Some theorists believe that negatively correlated home and host orientations are a function of sociopolitical context. Berry (1997) argues that a country's immigration policies influence the acculturative experience of immigrants. Others explain that "through intercultural contact, dominant host majority members influence the acculturation strategies of immigrant group members" (Bourhis, Moise, Perreault, & Senecal, 1997, p. 375). When the BDM is put in sociopolitical context, it is speculated that Canadian society promotes integrationist styles of acculturation (Drieger, 1996), whereas U.S. society promotes assimilationist styles of acculturation (Bourhis et al., 1997). Compare, for example, Canada's Multiculturalism Act (passed in 1988) with California's Proposition 187 (passed in 1994). Arguably, the former policy codifies biculturalism, whereas the later policy (which denies social services to the children of some immigrants) codifies assimilationism. When our findings are put in political context, they are no surprise to sociopolitical theorists. Immigrants to the United States (especially this sample of Asian American students) live in a society that rewards assimilation, and thus, their cultural orientations are likely to be inversely correlated (Bourhis et al., 1997).

Although our findings may fit the sociopolitical interpretation, it is premature to read the acculturation literature with the simple premise that Canada promotes integrationism whereas the United States promotes assimilation. In an Asian Canadian sample, for example, Nguyen et al. (1999) report a significant negative correlation ($r = -.43$) between home and host orientations. LaRoche, Kim, Hui, and Tomiuk (1998) have reported several negative correlations, most around $r = -.40$, between home and host questions for French Canadians as well as Italian Canadians. Conversely, uncorrelated home and host orientations have been found in some U.S. immigrants (Sanchez & Fernandez, 1993; Tsai et al., 2000).

Ethnogenesis interpretation. Whenever acculturation phenomena overlap with ethnicity phenomena, ethnogenesis—the creation of a new ethnicity—is a key process (Roosens, 1989). We believe that Asian American acculturation often involves ethnogenesis and that Asian American acculturation is something more than home and host orientations. As such, Asian American acculturation cannot be reduced to home and host orientations, regardless of whether those orientations are orthogonal. In effect, the issue of orthogonality is reframed by the introduction of a third cultural dimension; specifically, the dimension of emergent ethnicity.

As an analogy, consider Glazer and Moynihan's (1970) description of Italian Americans living in New York City:

As the old culture fell away—and it did rapidly enough—a new one, shaped by the distinctive experience of life in America, was formed and a new identity was created. Italian-Americans might share precious little with Italians in Italy, but in America they were a distinctive group that maintained itself, was identifiable, and gave something to those who identified with it. (p. xxxiii)

If ethnogenesis describes Italian Americans in New York City, we believe it describes other hyphenated Americans as well, such as Chicanos in Los Angeles, Irish Americans (Southies) in Boston, and Chinese Americans in San Francisco. In each case, the point is that hyphenated Americans may develop a new, unique ethnic identity (Yancey, Ericksen, & Juliani, 1976) regardless of their home and host orientations.

In Figure 4, we present a new tridirectional model (TDM) of acculturation. Our TDM includes two axes and one wide arrow. The two axes are the home and host orientations from the BDM. These axes are obliquely rotated, allowing for the correlation between home and host orientations. More important, the wide arrow represents ethnogenesis—the emergence of a new culture (Oswald, 1998). In the United States, Chicanos are perhaps the best example of ethnogenesis (Roosens, 1989). Being Chicano/a in Los Angeles is not merely a function of "being Mexican" and "being American." Indeed, many Chicanos reject the label "Mexican American" as misleading (Gurin, Hurtado, & Peng, 1994; Keefe & Padilla, 1987). Although many Asian Americans use hyphenated labels with pride (e.g., Korean Americans, Chinese Americans), we believe our TDM of ethnogenesis applies to most Asian American groups. Being Chinese American, for example, is often more than the sum of "being Chinese" and "being American."

In short, our nonorthogonality finding invites new conceptualizations of assimilation and its alternatives. Thus, we offer ethnogenesis as a key principle (as a third direction) in acculturation theory. Perhaps, as suggested

by Tsai et al. (2000), the UDM is ideal for first-generation immigrants, whereas the BDM is ideal for second-generation immigrants. If so, we add that the TDM may be ideal for third-generation immigrants.

Model Superiority

In this study, model superiority was framed in four ways. First, the UDM and BDM scales were correlated with a battery of 25 criterion variables. Here, the UDM scale (the SLS-U) was the best predictor of generational status. The home orientation of the BDM (the Asian-focused scale) was the best predictor of ethnic identity, SVS traditionalism, and SAT math scores. The host orientation (the Euro-focused scale) was the best predictor of NEO openness to experience and SAT verbal scores. Second, the bivariate correlations of the SLS-U scale were squared and compared against the R^2 's of the two BDM scales. Not surprisingly, the BDM outperformed the UDM on most variables—two predictors usually outperform one predictor. Third, all possible two-predictor models were compared with each other. Results from this analysis confirmed that the predictive advantages of the BDM scales were a function of size (two BDM scales vs. only one UDM scale), not because the BDM scales were inherently a better pair of predictors.

Fourth and most important, model superiority was investigated as a matter of “uniquely explained” variance (see spR^2 's in Table 5). Here again, no acculturation model (or scale) was consistently superior to other models. Rather, model superiority was infrequent and domain-specific. The UDM scale, for example, explained unique variance in generational status. The Asian-focused scale explained unique variance in Asian preferences, cultural knowledge, and ethnic identity. The Euro-focused scale explained unique variance in SAT verbal scores. Although these differences are interesting, they stand against a backdrop of overall model equality. In general, the shared variance predicted by the scales was much larger than the unique variance predicted by any one scale. Theorists will differ, of course, on how they interpret these results.

The case for the UDM. Citing the need for parsimony, proponents of the UDM can argue that the above results champion the UDM. If both models perform equally well at predicting criteria, proponents of the UDM can argue that their model makes a better trade-off between economy and specificity. Regarding economy, the UDM requires fewer items, takes less time to administer, and is easier to interpret. As for its lack of specificity, the UDM is only a model. In psychology, such models are seldom comprehensive, let alone explicit, in their details. The BDM, for example, fails to explain ethnogenesis and many other types of acculturation (Bourhis et al., 1997;

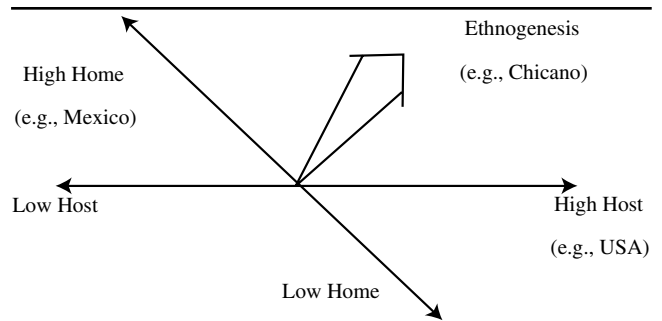


Figure 4 Tridirectional model (TDM) of acculturation.

Coleman, 1995; LaFromboise, Coleman, & Gerton, 1993; Roosens, 1989). Likewise, the UDM should not be required to explain all possible types of acculturation. The fact that the UDM explains large portions of criterion variance is enough to vindicate its utility.

The case for the BDM. Citing the need for generativity, proponents of the BDM can argue that the above results champion the BDM. In this study, the BDM produced slightly larger findings (incremental validities) with Asian preferences, cultural knowledge, ethnic identification, verbal SAT, and openness to experience. Potentially, such findings will generate new theoretical insights into acculturation. In contrast, the UDM displayed incremental validity with only one criterion; namely, generational status. Thus, in this data, the BDM was slightly more generative than the UDM. Generativity is very important to proponents of the BDM. Arguably, the insights generated by the BDM hold promise of correcting melting-pot assumptions and promoting political sensitivity among ethnicities.

CONCLUSION

Was there a clear empirical winner in this contest between the UDM and BDM? In this data, the answer is no—neither model demonstrated overall empirical superiority. Both models performed equally well, predicting many criteria with superb validity. The models revealed only modest gains (slight advantages) in incremental validity. The UDM was a slightly better predictor of generational status. In contrast, the BDM was a slightly better predictor of Asian preferences, cultural knowledge, SAT scores, and so forth. In some contexts, these modest gains in incremental validity may be important. In this study, for example, the BDM explained extra variance in math and verbal SAT scores. This recommends the BDM for research on educational achievement. In other contexts, the UDM may be preferred because it is more economical or because it is a useful proxy measure

(Trimble, 1998) of those aspects of acculturation that involve generational status.

In conclusion, there may be no "single best" acculturation model. Instead, social scientists must select the acculturation model that best matches their research topic and their population. In some cases, the UDM will be sufficient (Tsai et al., 2000). In other cases, the BDM will be optimal (Ryder et al., 2000). For their part, acculturation researchers will continue to discover—by topic and by population—the comparative validity of their acculturation models. Beyond this, there is the need to develop new conceptualizations of acculturation (Coleman, 1995; LaRoche et al., 1998), including our own tridirectional model of ethnogenesis.

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