

## Developing and validating a multidimensional consumer-based brand equity scale

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### Abstract

Little systematic research has been done to develop a scale to measure consumer-based brand equity. The authors report the results of a multistep study to develop and validate a multidimensional consumer-based brand equity scale (MBE) drawn from Aaker's and Keller's conceptualizations of brand equity. A total of 1530 American, Korean American, and Korean participants evaluated 12 brands from three product categories (athletic shoes, film for cameras, and color television sets). Multistep psychometric tests demonstrate that the new brand equity scale is reliable, valid, parsimonious, and generalizable across several cultures and product categories. The authors discuss theoretical and practical implications of the study. © 2001 Elsevier Science Inc. All rights reserved.

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In the past decade, researchers have focused a tremendous amount of attention on the *brand equity* construct, which refers to the incremental utility or value added to a product by its brand name. Using a consumer-based behavioral view of brand equity, we define brand equity as consumers' different response between a focal brand and an unbranded product when both have the same level of marketing stimuli and product attributes. The difference in consumer response may be attributed to the brand name and demonstrates the effects of the long-term marketing invested into the brand.

Researchers have found that a product's brand equity positively affects future profits and long-term cash flow (Srivastava and Shocker, 1991), a consumer's willingness to pay premium prices (Keller, 1993), merger and acquisition decision making (Mahajan et al., 1994), stock prices (Simon and Sullivan, 1993; Lane and Jacobson, 1995), sustainable competitive advantage (Bharadwaj et al., 1993),

and marketing success (Ambler, 1997). Almost every marketing activity works, successfully or unsuccessfully, to build, manage, and exploit brand equity (see Aaker, 1991; Keller, 1993; Yoo, Donthu, and Lee, 2000). However, despite this considerable amount of interest, research that identifies and attempts to understand brand equity phenomena has been hampered because there has been no agreement regarding what brand equity is and, more important, how it should be measured.

Although several studies have examined brand equity, their main focus was not on developing a brand equity measure. Currently, researchers use ad hoc measures such as price premium (Aaker, 1991), conjoint analyzed value of the brand name (Rangaswamy et al., 1993; Cobb-Walgren et al., 1995), composite multiattribute weighted scores of the brand name (Park and Srinivasan, 1994), a collection of consumer-based measures (Agarwal and Rao, 1996), and a scanner data-based measure (Kamakura and Russell, 1993). Other ad hoc measures include financial values of a brand, such as future earnings (Aaker, 1991), incremental cash flow (Simon and Sullivan, 1993), equalization price (Swait et al., 1993), and momentum accounting-based value (Farquhar et al., 1991). However, these measures were developed without rigorous psychometric tests, and they were not parsimonious enough to manage.

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The purpose of this study is to develop a multidimensional measure of consumer-based brand equity and assess its psychometric properties. Here, *consumer-based* means measurement of cognitive and behavioral brand equity at the individual consumer level through a consumer survey. In contrast, for firm-based measures, researchers collect financial market, accounting, and store-level scanner data without contacting consumers; these then identify dollar-metric and financial brand equity at the firm or brand level. Unlike most previous studies, this study develops a measure of brand equity that is reliable, valid, and parsimonious. In addition, the measure's latent structure is assessed for generalizability across multiple samples drawn from several cultures, specifically, Koreans, Korean Americans, and Americans. In particular, our measure is developed using the brand equity dimensions that Aaker (1991, also see 1996) and Keller (1993) suggest, which have been popularly accepted as valid and comprehensive. However, key questions about Aaker's and Keller's measurements remain unanswered, specifically, the structural validity of the measurement.

A consumer-based brand equity scale is beneficial in several ways. First, it offers a means to test brand equity theories. According to Aaker (1991), brand equity provides value to customers by enhancing their interpretation and processing of information, confidence in the purchase decision, and satisfaction. Brand equity also provides value to the firm by enhancing efficiency and effectiveness of marketing programs, prices and profits, brand extensions, trade leverage, and competitive advantage. Similarly, Keller (1993) proposes that enhancing brand equity results in the ability to command larger margins from consumers, elicits increased consumer information search, and improves marketing communication effectiveness, licensing opportunities, and consumers' responsiveness to brand extensions. A brand equity measure would allow investigation of the role of brand equity in Aaker's (1991) and Keller's (1993) models. Specifically, it may be used to measure the brand equity of existing brands, then to examine the relationship of brand equity to the resulting firm and consumer benefits.

Second, the measure would be more useful for testing consumer-based brand equity theories than other previous measures have been. A consumer-based brand equity study needs a measure that assesses an individual customer's brand equity. However, some of the previous measures are designed to measure brand equity of aggregate products at the industry or firm level (e.g., Simon and Sullivan, 1993; Mahajan et al., 1994). Others measure an individual customer's brand equity (e.g., Rangaswamy et al., 1993; Swait et al., 1993; Park and Srinivasan, 1994; Cobb-Walgreen et al., 1995), but the psychometric properties have not been reported or fully analyzed. As a result, the previous measures may not be appropriate to studies that examine consumer-based brand equity phenomena.

Many scale development studies take an emic approach, in which a scale is first developed in one culture, then

validated or replicated in other cultures (see Netemeyer et al., 1991; Durvasula et al., 1993). We develop a brand equity measure with an etic approach, in which a universal measurement structure across cultures is sought using multiple cultures simultaneously (Geertz, 1973). The outcome measure that an etic approach produces is functionally, conceptually, linguistically, and metrically equivalent across cultures, which provides the basis for generating valid cross-cultural comparisons (Berry, 1980; Leung and Bond, 1989; Meredith, 1993; Rosenzweig, 1994).

After surveying several cultures, we assess the universality of our brand equity measurement. Confirming the universality enables cross-cultural benchmarking of brand equity, because the measure is not bound to a particular culture or country. Cross-cultural benchmarking is useful for tracking performance and developing strategies in the domestic and international markets, and in the cross-cultural study of brand equity.

We collect data from South Korea and the US because these two countries show an adequate range of cultural variation. According to Hofstede's (1991) work, Koreans and Americans are different in every major cultural dimension. In comparison with Americans, for example, Koreans rate high on Confucian dynamism (long-term orientation), low on individualism, and high on uncertainty avoidance. Therefore, South Korea is a good counterweight to the US, and Korean responses should reduce potential bias that could result from developing and validating a measure using samples drawn only from a Western culture.

In the following sections, we first examine the brand equity construct and identify its relevant dimensions as proposed by Aaker (1991) and Keller (1993). Next, we discuss the procedures used to generate and select scale items in the pilot and main studies. Then, we assess internal consistency, validity, and cross-cultural metric equivalence. Finally, we discuss the implications of the final scale to both practitioners and researchers.

## 1. The brand equity construct

*Brand equity* has many definitions and forms, such as favorable impressions, attitudinal dispositions, and behavioral predilections (Rangaswamy et al., 1993); brand loyalty, brand awareness, perceived quality, brand associations, and other proprietary brand assets (Aaker, 1991); brand knowledge such as brand awareness and brand associations (Keller, 1993); loyalty and image (Shocker and Weitz, 1988); the added value endowed by the brand name (Farquhar et al., 1991); incremental utility (Kamakura and Russell, 1993); the difference between overall brand preference and multiattributed preference based on objectively measured attribute levels (Park and Srinivasan, 1994); and overall quality and choice intention (Agarwal and Rao, 1996). One important consensus among the definitions is that brand equity is the incremental value

of a product due to the brand name (Srivastava and Shocker, 1991).

Collectively, brand equity consists of four dimensions: brand loyalty, brand awareness, perceived quality of brand, and brand associations, as proposed by Aaker (1991, 1996) and Keller (1993). These dimensions may be used to explore the findings of marketing and consumer behavior research in relation to brand equity (see Barwise, 1993); thus, we develop a brand equity measure that capitalizes on these dimensions.

Aaker (1991, p. 39) defines brand loyalty as “the attachment that a customer has to a brand.” In our study, *brand loyalty* refers to the tendency to be loyal to a focal brand, which is demonstrated by the intention to buy the brand as a primary choice (Oliver, 1997). In contrast, some previous research has focused on the behavioral aspects of brand loyalty (e.g., Guadagni and Little, 1983; Gupta, 1988). *Brand awareness* is “the ability for a buyer to recognize or recall that a brand is a member of a certain product category” (Aaker, 1991, p. 61). Thus, brand awareness consists of both brand recognition and recall (Rossiter and Percy, 1987; Keller, 1993). *Perceived quality* is “the consumer’s judgment about a product’s overall excellence or superiority” (Zeithaml, 1988, p. 3). It therefore is based on consumers’ or users’ (i.e., not managers’ or experts’) subjective evaluations of product quality. Aaker (1991, p. 109) defines *brand associations* as “anything linked in memory to a brand” and brand image as “a set of [brand] associations, usually in some meaningful way.” The associations have a level of strength (Aaker, 1991; Aaker and Keller, 1990; Keller, 1993), and a link to a brand will be stronger when it is based on many experiences or exposures than when it is based on few (Aaker, 1991).

## 2. Item generation

After careful consideration of the literature and on the basis of the definitions previously established, we generated a pool of 48 candidate scale items to reflect the dimensions of brand equity. To establish content validity, the items were evaluated for conformity to the theoretical definitions and redundancy. After screening the items independently, then jointly, we retained 22 items for initial psychometric assessment: five on brand loyalty, four on brand awareness, seven on perceived quality, and six on brand associations.

We designed five brand loyalty items to capture the overall attitudinal loyalty to a specific brand rather than directly measuring actual brand-loyal behavior (see Guadagni and Little, 1983; Gupta, 1988). We adopted and modified Beatty and Kahle’s (1988) brand loyalty items. Brand awareness may be measured as brand recognition or brand recall. We measured simple brand recognition rather than brand recall. Four items were based on previous research (Srull, 1984; Alba and Hutchinson, 1987; Rossiter and Percy, 1987).

We designed perceived quality items to assess consumers’ subjective judgment about a brand’s overall excellence (Zeithaml, 1988) because perceived quality represents overall quality rather than individual elements of quality (Petroshius and Monroe, 1987; Aaker and Keller, 1990; Boulding and Kirmani, 1993). We adopted seven of the items used by Dodds et al. (1991). We designed brand associations items to measure “the strength of connection to a brand node as a function of both the amount or quantity of processing the information received at encoding and the nature or quality of the processing of the information received at encoding” (Keller, 1993, p. 5). On the basis of this definition, we developed six items for the overall perceptual strength of brand associations.

### 2.1. Stimuli selection

We selected three product categories as stimuli: film for cameras (a low-cost, fast-replacement cycle, short-term experience good), athletic shoes (a medium-cost, medium-replacement cycle, medium-term experience good), and color television sets (a high-cost, slow-replacement cycle, longer-term experience good). An experience good is a product that consumers must actually experience, through consumption or purchase, to judge its quality (Nelson, 1974). Three criteria guided the selection of these product categories. First, the categories were different in price range, frequency of purchase, consumers’ product involvement, and consumption situation (e.g., place, time, and interaction among users). This wide variety of products was selected to enhance the assessment of the cross-product applicability of the scale. Second, the participants in this study, college student consumers, were familiar with the categories. Their experience with the products enabled them to provide reliable and valid responses to a questionnaire. For example, in both Korea and the US, more than 90% of the university student consumers purchase athletic shoes. Annual market reports by research firms in Korea and the US have shown that a significant number of both Korean and American students experience these product categories. Third, only consumer goods were selected because of their high brand equity. Consumer goods’ brand value variance is explicitly attributable to the brand equity variance (Simon and Sullivan, 1993).

We surveyed 12 brands: six athletic shoes (Adidas, Asics, LA Gear, Nike, Puma, and Reebok), four films (Agfa, Fuji, Kodak, and Konica), and two color television sets (Samsung and Sony). We used two criteria in selecting the brands. First, the brands had to be available in both Korea and the US. Second, the brands had to be markedly different. According to the market reports mentioned previously, the market share of the selected brands in the Korean and American markets ranged from 0.5% to 12.4% in athletic shoes, 0.5% to 41.2% in film, and 0.1% to 37.2% in television sets. We selected brands that held the highest,

lowest, and mid-level market shares. In addition, we selected brands with various countries of origin. The US is the country of origin for LA Gear, Nike, Reebok, and Kodak; Germany for Adidas, Puma, and Agfa; Japan for Asics, Fuji, Konica, and Sony; and South Korea for Samsung.

### 3. Item purification: the pilot study

#### 3.1. Subjects

The pilot sample was composed of 460 undergraduate university students, 230 from South Korea and 230 from the US. Elimination of incomplete data resulted in 414 useable surveys, 218 Koreans (117 men, 101 women) and 196 Americans (111 men, 85 women).

Researchers have suggested that the use of student subjects in measurement development research threatens the external validity and generalizability of findings due to the non-representativeness and unique characteristics of the population (e.g., Burnett and Dunne, 1986; Wells, 1993). However, in a cross-cultural study, well-matched (i.e., maximally homogeneous within and between cultures) samples are more useful than representative samples because they allow more exact theoretical predictions and reduce the confounding effects of other factors (Hofstede, 1991). More important, students are accepted for theory testing research in which the multivariate relationships among constructs, not the univariate differences (i.e., mean score comparisons) between samples, are being investigated (Calder et al., 1981). Students have been effective surrogates for non-students or adults in various empirical studies that have examined, for example, warranty and consumers' risk perceptions (Shimp and Bearden, 1982); country of origin, attitude toward advertising, and attitude–preference relationship (Yavas, 1994); product warnings and safe behavior (Cox et al., 1997); price–quality perceptions (Lichtenstein and Burton, 1989); dissonance reduction behavior (Sheth, 1970); self-identity acculturation (Owenbey and Horridge, 1998); and hiring recommendations (Olian et al., 1988).

#### 3.2. Instrumentation

We developed the questionnaire in English. Three other marketing researchers and an English-language professor examined its wording and the face validity of the questions. Next, two bilingual experts fluent in both English and Korean translated the questionnaire into Korean. The verbal equivalence between the Korean and English versions was checked through back-translation with the help of two other bilingualists in Korea (Douglas and Craig, 1983). This process was repeated until we agreed that the Korean questionnaire was adequately translated with compatible meaning.

In the pilot study, we used only four existing brands of athletic shoes as brand stimuli: Adidas, Nike, and Reebok

for both Koreans and Americans, and one local brand, Converse or Prospects, for Americans or Koreans, respectively. We prepared a different version of the questionnaire for each brand surveyed.

#### 3.3. Procedures and measures

Different versions of the questionnaire were assigned randomly to participants. The participants were told the purpose of the study was to provide managers with new insights about effective ways to manage brands successfully. Approximately 60 participants were assigned to each of the four different versions of the questionnaire. The participants were asked to indicate any unclear or uncomfortable wording in the questions. The questionnaire consisted of items to measure the dimensions of brand equity, as well as demographic questions. Brand equity items were evaluated with five-point Likert scales anchored at 1 = “strongly disagree” and 5 = “strongly agree.”

#### 3.4. Analysis and results

To select the items that would enter the main study, we computed the reliability of the items of each construct. We dropped any items of a construct with low correlation to the composite variable, retaining only those that had a 0.70 or higher Cronbach's  $\alpha$  coefficient for both samples (see Nunnally and Bernstein, 1994). Next, to obtain reasonable parsimony, when two items contributed similar Cronbach's  $\alpha$  coefficients, we dropped the weaker item. Also, we reworded several items to enhance clarity, based on the participants' comments. With this process, we selected six items for perceived quality, three for brand loyalty, three for brand awareness, and five for brand associations. We reevaluated these items in the main study.

## 4. Data collection and measures: the main study

In the main study, we administered the questionnaire to Korean, Korean American, and American samples. Following a process recommended by Anderson and Gerbing (1988), Nunnally and Bernstein (1994), and others, we conducted a series of exploratory and confirmatory factor analyses on the data. Our goal was to identify a final set of items with acceptable discriminant and convergent validity, internal consistency reliability, parsimony, and cross-cultural metric equivalence. We analyzed data at an individual level, a multigroup level, and a pooled level.

#### 4.1. Subjects

Undergraduate students at major universities in South Korea and the US participated. A total of 650 Korean participants in South Korea and 350 Korean American and 650 American participants in the US answered the question-

naire. After invalid responses, such as non-American citizens in the American sample, were excluded, the self-administered questionnaires yielded 1530 eligible responses: 633 Koreans (435 men and 198 women), 320 Korean Americans (173 men and 147 women), and 577 Americans (272 men and 305 women).

We included Korean American participants to examine the validity of the sample selection. In the process of their acculturation into the host (i.e., American) culture, Korean Americans are theorized to show some transition from Korean to American cultural and demographic characteristics (Wallendorf and Reilly, 1983; Deshpande et al., 1986). In that sense, the culture of Korean Americans is a hybrid of Korean and American culture. The analysis showed that Korean Americans (54.1%) had more male respondents than Americans did (47.1%) but fewer male respondents than Koreans did (68.7%). Korean Americans (48.1%) had part-time or full-time jobs more often than Koreans did (19.3%) but less frequently than Americans did (47.1%). In addition, household size among Korean Americans (4.0 members) was greater than among Americans (3.2 members) but smaller than among Koreans (4.2 members).

#### 4.2. Instrumentation and procedures

In addition to the brand equity items, the questionnaire included items of other constructs: attitude toward brand and purchase intention, product category involvement and experience, and brand purchase experience. We developed 12 versions of the questionnaire for the 12 brands surveyed in the three product categories. Across versions, we maintained the same format and order of question items.

American and Korean American participants answered the English questionnaire, whereas Korean participants answered the Korean questionnaire for their language convenience. Participants viewed one randomly assigned version of the questionnaire and then rated their brand equity evaluations for the particular brand in the questionnaire. Almost the same number of responses for each version was obtained, and there was no significant difference in the number of responses among the 12 versions. The number of responses per version ranged from 47 to 57 for Koreans, from 18 to 35 for Korean Americans and from 40 to 52 for Americans.

#### 4.3. Measures

Brand and product category experiences were measured with yes or no items. The item measuring product category purchase experience was "Have you ever bought any brand of product category X?"; for brand purchase experience, "Have you ever bought brand X?"; and for usage and ownership, "Do you currently use/own any brand of product category X?" Subsequently, brand equity

items were measured as in the pilot study. Next, brand purchase intention, brand attitude, and product category involvement were measured as follows: Purchase intention was measured as "I would like to buy X" and "I intend to purchase X" (five-point scale). Attitude toward brand was measured with five-item scales of "very bad/very good," "very nice/very awful," "very attractive/very unattractive," "very desirable/very undesirable," and "extremely likable/extremely unlikable." Product category involvement was measured with four five-point items: "I am very involved with product category X," "I use (wear) product category X very often," "I am a product category X expert," and "I am not interested in [the product category]." The brand equity items were asked before the items regarding brand attitude and purchase intention to reduce the halo effect common to multiattribute attitude models, in which subjects distort their perceptions when expressing their overall attitudes before they evaluate details that contribute to the attitudes (Beckwith and Lehmann, 1975; Cooper, 1981).

##### 4.3.1. Product experiences

Data show that a significant number of the participants had experienced the product categories. Those who had personally purchased athletic shoes, film, and color television sets were 95%, 91%, and 83%, respectively, of Americans; 92%, 90%, and 64% of Korean Americans; and 93%, 96%, and 16% of Koreans. Active users of athletic shoes, film, and color television sets were 93%, 72%, and 92%, respectively, of Americans; 88%, 78%, and 79% of Korean Americans; and 90%, 86%, and 95% of Koreans. Participants who had purchased the athletic shoe brands ranged from 36% (Asics) to 94% (Nike) of Americans, from 24% (LA Gear) to 88% (Nike) of Korean Americans, and from 26% (Puma) to 65% (Nike) among Koreans. For film, it ranged from 7% (Agfa and Konica) to 96% (Kodak) of Americans, 9% (Agfa) to 95% (Kodak) of Korean Americans, and 76% (Konica) to 94% (Kodak) of Koreans. For television sets, it was 10% (Samsung) and 36% (Sony) of Americans, 36% (Samsung) and 75% (Sony) of Korean Americans, and 38% (Samsung) and 2% (Sony) of Koreans. This rich product experience indicates that the participants might have developed strong attitudes toward the brands (Fazio and Zanna, 1981; Smith and Swinyard, 1983).

The four-item measure of product category involvement showed acceptable reliability, 0.82, 0.85, and 0.64 for Americans, Korean Americans, and Koreans, respectively. Product category involvement was significantly different among the selected products: 2.41, 3.08, and 2.66 ( $F = 32.78$ ,  $p < 0.0001$ ) for film, athletic shoes, and television sets, respectively, for Americans; 2.35, 2.94, and 2.69 ( $F = 10.80$ ,  $p < 0.0001$ ) for Korean Americans; and 2.21, 2.71, and 2.76 ( $F = 46.33$ ,  $p < 0.0001$ ) for Koreans. This wide variety of involvement strengthens the generalizability of the scale.

## 5. Analysis and results

We conducted three levels of analyses to develop a brand equity measure (see Durvasula et al., 1993). First, we performed an individual analysis to determine whether common items and dimensions were found in each sample. Second, we conducted a multigroup analysis to examine factorial invariance of the items selected in the individual analysis (Jöreskog and Sörbom, 1993; Bollen, 1989). The factorial invariance becomes the basis of cross-cultural comparisons of the constructs (Steenkamp and Baumgartner, 1998). Third, we conducted a pooled analysis to identify culture-free universal dimensions of brand equity in the pooled sample (Leung and Bond, 1989). Discovering the same dimensions in the individual, multigroup, and pooled analyses supports the universality of the dimensions across samples. We conducted an *O*-factor analysis of the 17 by 17 correlation matrix for the 17 brand equity items correlated across the 12 brands (Rummel, 1970).

### 5.1. Individual analysis

We explored whether a similar pattern of internal consistency and dimensionality among brand equity items could be found in each of the three samples. We selected items for each construct until no higher reliability could be achieved and obtained the same items across samples, five for perceived quality and three each for brand loyalty, brand associations, and brand awareness. These fourteen selected items showed excellent reliability: perceived quality with 0.92, 0.90, and 0.84 for Americans, Korean Americans, and Koreans, respectively; brand loyalty with 0.88, 0.86, and 0.87; brand associations with 0.83, 0.79, and 0.78; and brand awareness with 0.93, 0.91, and 0.84. However, exploratory factor analysis did not produce four distinct factors among the selected brand equity items, mainly because of the inseparability of brand awareness and brand associations. Only three factors (i.e., perceived quality, brand loyalty, and brand awareness/associations) were consistently found in each sample.

To examine the dimensionality of brand equity, we established three sets of measurement models, one-, three-, and four-dimensional, where the four-dimensional model comprises brand loyalty, perceived quality, brand awareness, and brand associations. We used confirmatory factor analysis and estimated the models through the LISREL 8 maximum likelihood method (Jöreskog and Sörbom, 1993). We then compared 2 four-dimensional models: Model 1, in which the correlation between brand awareness and brand associations is specified to be free, and Model 2, in which the correlation is constrained to be equal with unity. According to the results of these methods, brand awareness and associations should be combined due to a lack of discriminant validity when either (1) there is no significant  $\chi^2$  difference between the two models (Bagozzi, 1980; Burnkrant and Page, 1982; Anderson and Gerbing, 1988) or (2) the

squared correlation between awareness and associations is greater than the average variance extracted for awareness and associations (Fornell and Larcker, 1981).

As we report in Part A of Table 1, the  $\chi^2$  difference test between Models 1 and 2 was significant in each sample ( $\chi^2$  degrees of freedom [*d.f.*] = 1 = 115.72 for Americans, 92.12 for Korean Americans, and 38.22 for Koreans). As shown in Table 2, however, the correlation between awareness and associations was very high in Model 1 (0.88 for Americans, 0.80 for Korean Americans, and 0.90 for Koreans). Accordingly, the squared correlation (0.77, 0.64, and 0.81 for Americans, Korean Americans, and Koreans, respectively) was greater than the average variance extracted for awareness (0.82, 0.77, and 0.64) and associations (0.64, 0.58, and 0.54), as reported in Part B of Table 1. Therefore, despite passing the  $\chi^2$  test, by failing the variance comparison test, discriminant validity between brand awareness and associations was not proven in each sample.

By combining these two dimensions, we created a new measurement model, Model 3, composed of the three dimensions of brand loyalty, perceived quality, and brand awareness/associations. To examine further whether combining awareness and associations is better than combining any possible pair of the dimensions, we compared the fit of Model 3 with the fit of all remaining three-dimensional models (Models 4 through 8). Table 1 (Part A) shows that the  $\chi^2$  fit index of the other models was worse than that of Model 3. To investigate whether three-dimensionality is desirable, we also compared Model 3 with the one-dimensional model, Model 9, in which all four dimensions are combined into one dimension. But the  $\chi^2$  fit index of Model 9 was significantly poorer than any other previous model. Therefore, we used Model 3 in subsequent analyses.

Model 3 was also supported by other values of fit (see Table 1). Its goodness-of-fit index (GFI) was 0.87, 0.87, and 0.94 for Americans, Korean Americans, and Koreans, respectively, and the adjusted goodness-of-fit index (AGFI) was 0.82, 0.82, and 0.92. Comparative goodness of fit indexes in both comparative fit index (CFI) and incremental fit index (IFI) were 0.93, 0.91, and 0.95. The standardized root mean square residual (SRMR) was 0.061, 0.060, and 0.054. These fit indexes indicate an excellent level of fit of the model (see Hu and Bentler, 1999). In addition, the loadings of the items to their corresponding dimensions ranged from 0.58 to 0.87 for Americans, 0.50 to 0.93 for Korean Americans, and 0.63 to 0.94 for Koreans. The smallest *t*-value of the loadings was 9.31 across samples, which indicates high significance of the loadings. The composite reliability estimates, which are internal consistency reliability measures as evidence of convergent validity (Fornell and Larcker, 1981) were acceptable, ranging from 0.88 to 0.92 for Americans, 0.86 to 0.90 for Korean Americans, and 0.84 to 0.89 for Koreans. The average variance extracted for each dimension was greater than the squared correlation between the dimension and any other

Table 1

Dimensionality and internal consistency of the brand equity scale

*d.f.* = degrees of freedom, SRMR = standardized root mean square residual, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, CFI = comparative fit index, IFI = incremental fit index, and VE = variance explained for.

Part A: Dimensionality									
	Americans			Korean Americans			Koreans		
$\chi^2$ of the four-dimensional model									
Model 1: $\phi_{\text{awareness:associations}} = \text{free}$ ( <i>d.f.</i> = 71)	391.58			212.84			223.24		
Model 2: $\phi_{\text{awareness:associations}} = 1$ ( <i>d.f.</i> = 72)	507.30			304.96			261.46		
$\chi^2$ of the three-dimensional model ( <i>d.f.</i> = 74)									
Model 3: Awareness and associations are combined	533.09			317.81			273.59		
Model 4: Brand loyalty and perceived quality are combined	1143.35			549.37			1028.03		
Model 5: Brand loyalty and associations are combined	1279.53			694.33			1089.00		
Model 6: Perceived quality and associations are combined	1302.37			679.41			1153.37		
Model 7: Brand loyalty and awareness are combined	1357.37			733.28			1129.49		
Model 8: Perceived quality and awareness are combined	1999.40			946.51			1426.86		
$\chi^2$ of the one-dimensional model ( <i>d.f.</i> = 77)									
Model 9	2906.09			1533.59			2269.89		
Fit statistics									
	Model 3: Three-dimensional model			Model 1: Four-dimensional model					
	Americans	Korean Americans	Koreans	Americans	Korean Americans	Koreans			
$\chi^2$	533.09	317.81	273.59	391.58	212.84	223.24			
<i>d.f.</i>	74	74	74	71	71	71			
SRMR	0.061	0.060	0.054	0.052	0.049	0.051			
GFI	0.87	0.87	0.94	0.90	0.91	0.95			
AGFI	0.82	0.82	0.92	0.85	0.87	0.93			
CFI	0.93	0.91	0.95	0.95	0.95	0.96			
IFI	0.93	0.92	0.95	0.95	0.95	0.96			
Part B: Internal consistency									
	Americans			Korean Americans			Koreans		
	Composite $\alpha$	Coefficient $\alpha$	VE	Composite $\alpha$	Coefficient $\alpha$	VE	Composite $\alpha$	Coefficient $\alpha$	VE
<i>Model 3: Three-dimensional model</i>									
Brand loyalty	0.88	0.88	0.71	0.86	0.86	0.68	0.87	0.87	0.69
Perceived quality	0.92	0.92	0.69	0.90	0.90	0.68	0.84	0.84	0.53
Awareness/associations	0.92	0.92	0.67	0.89	0.89	0.59	0.89	0.88	0.58
<i>Model 1: Four-dimensional model</i>									
Brand loyalty	0.88	0.88	0.71	0.86	0.86	0.68	0.87	0.87	0.69
Perceived quality	0.92	0.92	0.69	0.90	0.90	0.65	0.84	0.84	0.53
Awareness	0.93	0.93	0.82	0.91	0.91	0.77	0.84	0.84	0.64
Associations	0.84	0.83	0.64	0.79	0.79	0.58	0.77	0.78	0.54

dimension and 0.50, which indicates the independence of the dimensions (Fornell and Larcker, 1981). In summary, brand loyalty, perceived quality, and brand awareness/associations make three reliable and valid dimensions of brand equity in each sample.

5.2. Multigroup analysis

We subsequently performed an invariance test for Model 3, which is useful in examining the equivalence of a factorial measurement or structure model across multiple samples (see Bollen, 1989; Durvasula et al., 1993; Jöreskog

and Sörbom, 1993). In particular, we tested whether the factor structure (i.e., item loadings to factors) was statistically invariant among the three samples by comparing an unconstrained and a constrained model. In the unconstrained model, the factor structure is specified to vary across cultures, whereas the factor structure is constrained to be the same across cultures in the constrained model. When the  $\chi^2$  fit difference between these models is insignificant, the factor structure is invariant across samples. As Table 3 shows, the LISREL likelihood maximum method of estimation produced a  $\chi^2$  fit index of 1124.49, with 222 *d.f.* for the unconstrained model.

Table 2

Intercorrelations among dimensions

A = Americans, KA = Korean Americans, and K = Koreans.

Model 1: Four-dimensional model

	Brand loyalty			Perceived quality			Awareness			Associations		
	A	KA	K	A	KA	K	A	KA	K	A	KA	K
Brand loyalty	1	1	1									
Perceived quality	0.50	0.52	0.38	1	1	1						
Awareness	0.30	0.15	0.28	0.45	0.38	0.18	1	1	1			
Associations	0.38	0.29	0.30	0.52	0.37	0.29	0.88	0.80	0.90	1	1	1

Model 3: three-dimensional model

	Brand loyalty			Perceived quality			Awareness/Associations		
	A	KA	K	A	KA	K	A	KA	K
Brand loyalty	1	1	1						
Perceived quality	0.50	0.52	0.38	1	1	1			
Awareness/associations	0.33	0.19	0.30	0.48	0.40	0.24	1	1	1

For the constrained model, the fit was  $\chi^2_{d.f. = 250} = 1215.63$ . Thus, the fit difference was not insignificant ( $\Delta\chi^2_{d.f. = 28} = 91.24, p < 0.0001$ ). This result suggests that the factor structure is not invariant across cultures; therefore, brand equity evaluations cannot be compared meaningfully across samples due to lack of cross-cultural metric equivalence (Steenkamp and Baumgartner, 1998).

To locate the source of inequality within the specified matrix and discover an invariant measurement model across cultures, we conducted a partial measurement invariance test, as suggested by Byrne et al. (1989). We tested the invariance of each factor loading by declaring the loading alone to be invariant across samples. To detect the invariance, we conducted the  $\chi^2$  difference test with the uncon-

strained model of  $\chi^2_{d.f. = 222} = 1124.49$ . The test revealed that the metric inequivalence occurred because of three perceived quality items (i.e., QL1, QL4, and QL5) and one awareness item (i.e., AW1). By excluding these four items and combining the remaining 10 invariant items, we generated an etic measure of brand equity. The 10 items comprise three brand loyalty items, two perceived quality items, and five brand awareness/associations items (see Appendix A). The unconstrained model ( $\chi^2_{d.f. = 96} = 424.65$ ), in which the 10 factor loadings were specified to vary across cultures, was compared with the constrained model ( $\chi^2_{d.f. = 116} = 455.66$ ), in which the 10 factor loadings were constrained to be invariant across cultures. The  $\chi^2$  difference was not significant ( $\Delta\chi^2_{d.f. = 20} = 31.01, p >$

Table 3

Simultaneous tests of invariance

LO1, LO2, and LO3 = brand loyalty items; QL1, QL2, QL3, QL4, and QL5 = perceived quality items; AW1, AW2 and AW3 = brand awareness items; and AS1, AS2, and AS3 = brand associations items.

Competing models	$\chi^2$	<i>d.f.</i>	$\Delta\chi^2$	$\Delta d.f.$
The unconstrained model: Model 3 with factor loadings variant	1124.49	222	–	–
The constrained model: Model 3 with factor loadings invariant	1215.63	250	91.24**	28
Model 3 with LO1 on brand loyalty factor invariant	1127.98	224	3.49	2
Model 3 with LO2 on brand loyalty factor invariant	1129.17	224	4.68	2
Model 3 with LO3 on brand loyalty factor invariant	1125.00	224	0.51	2
Model 3 with QL1 on perceived quality factor invariant	1130.99	224	6.50*	2
Model 3 with QL2 on perceived quality factor invariant	1127.81	224	3.32	2
Model 3 with QL3 on perceived quality factor invariant	1124.68	224	0.19	2
Model 3 with QL4 on perceived quality factor invariant	1144.63	224	20.14**	2
Model 3 with QL5 on perceived quality factor invariant	1142.24	224	17.75**	2
Model 3 with AW1 on awareness/associations factor invariant	1139.25	224	14.76**	2
Model 3 with AW2 on awareness/associations factor invariant	1128.73	224	4.24	2
Model 3 with AW3 on awareness/associations factor invariant	1127.32	224	2.83	2
Model 3 with AS1 on awareness/associations factor invariant	1125.12	224	0.63	2
Model 3 with AS2 on awareness/associations factor invariant	1127.26	224	2.77	2
Model 3 with AS3 on awareness/associations factor invariant	1128.32	224	3.83	2

\*  $p < 0.05$ .\*\*  $p < 0.001$ .

Table 4

Maximum likelihood estimates and standard errors (SE)

LO = brand loyalty factor; QL = perceived quality factor; and AWAS = brand awareness/association factor.  $\chi^2_{d.f. = 116} = 455.66$ , SRMR = 0.066, GFI = 0.91, CFI = 0.96, and IFI = 0.96.

Parameter	Across-culture equivalencies		Americans		Korean Americans		Koreans	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
$\lambda_{LO1, LO}$	0.86	0.02						
$\lambda_{LO2, LO}$	0.88	0.02						
$\lambda_{LO3, LO}$	0.77	0.02						
$\lambda_{QL2, QL}$	0.85	0.03						
$\lambda_{QL3, QL}$	0.80	0.03						
$\lambda_{AW2, AWAS}$	0.82	0.02						
$\lambda_{AW3, AWAS}$	0.79	0.02						
$\lambda_{AS1, AWAS}$	0.79	0.02						
$\lambda_{AS2, AWAS}$	0.81	0.02						
$\lambda_{AS3, AWAS}$	0.61	0.02						
$\theta_{LO1, LO1}$			0.26	0.02	0.38	0.04	0.26	0.02
$\theta_{LO2, LO2}$			0.18	0.02	0.19	0.03	0.30	0.03
$\theta_{LO3, LO3}$			0.43	0.03	0.40	0.04	0.39	0.03
$\theta_{QL2, QL2}$			0.26	0.04	0.34	0.05	0.24	0.04
$\theta_{QL3, QL3}$			0.37	0.04	0.41	0.05	0.32	0.04
$\theta_{AW2, AW2}$			0.26	0.02	0.39	0.04	0.37	0.03
$\theta_{AW3, AW3}$			0.32	0.02	0.40	0.04	0.42	0.03
$\theta_{AS1, AS1}$			0.38	0.03	0.39	0.04	0.37	0.03
$\theta_{AS2, AS2}$			0.25	0.02	0.34	0.04	0.44	0.03
$\theta_{AS3, AS3}$			0.57	0.04	0.69	0.06	0.65	0.04
$\phi_{LO, QL}$			0.49	0.04	0.37	0.04	0.54	0.05
$\phi_{LO, AWAS}$			0.34	0.04	0.32	0.04	0.25	0.06
$\phi_{QL, AWAS}$			0.49	0.04	0.25	0.04	0.41	0.06

0.05). Therefore, the hypothesis of an invariant pattern of factor loadings was tenable. Table 4 reports the maximum likelihood estimates for the 10 items. All the factor loading, error, and factor intercorrelation estimates were significant at the 0.0001 level, and the fit indexes were SRMR = 0.066, GFI = 0.91, CFI = 0.96, and IFI = 0.96. The reliability was also satisfactory: 0.88, 0.86, and 0.87 for brand loyalty among Americans, Korean Americans, and Koreans, respectively; 0.81, 0.77, and 0.84 for perceived quality; and 0.90, 0.86, and 0.86 for brand awareness/associations.

### 5.3. Pooled analysis

To check the cross-cultural validity of the 10 items further, we conducted an *individual-level multicultural factor analysis*, as suggested by Leung and Bond (1989). This technique provides a meaningful way to pool cross-cultural data and discover etic dimensions at the individual level while eliminating response sets often found in cross-cultural data. Leung and Bond's procedure begins with a double-standardization procedure. First, a within-subject procedure standardizes scores across the variables for each subject. The mean of the variables becomes zero, and the standard deviation becomes one for each individual in any culture. This removes the cultural positioning effect, "the relative location of the responses made by the average individual from a particular culture" (Leung and Bond, 1989, p. 141). Under the cultural positioning effect, even though certain variables show no relationships in individual cultures, when a set of the vari-

ables' mean scores is used as a data point per culture, the relationships between the variables may appear. Second, a within-culture standardization, in which any variable has a zero mean and unity standard deviation within each cultural group, eliminates the patterning effect of culture, under which a different culture shows a different relationship between variables. After these standardizations, the data are pooled across cultures and analyzed, and the dimensions or measures obtained are etic measures.

After we pooled data from the three samples using Leung and Bond's procedure, we examined three kinds of measurement models for the 10 items (i.e., four-, three-, and one-dimensional), as we did in the individual analysis. First, the four-dimensional model ( $\chi^2_{d.f. = 29} = 219.82$ ), in which the correlation between brand awareness and associations was unconstrained, was compared with the other four-dimensional model ( $\chi^2_{d.f. = 30} = 317.46$ ), in which the correlation between the two factors was constrained to be unity. The  $\chi^2$  difference ( $\Delta\chi^2_{d.f. = 1} = 97.64$ ,  $p < 0.0001$ ) was significant. But high correlation (0.89) between brand awareness and associations suggested the inseparability of those two constructs. The squared correlation (0.79) between the two factors was larger than the average variance extracted for either awareness (0.70) or associations (0.58). Therefore, the four-dimensional model was not supported due to lack of discriminant validity between brand awareness and associations. Second, the three-dimensional model of brand loyalty, perceived quality, and brand awareness/associations showed a better fit ( $\chi^2_{d.f. = 32} = 326.19$ ) than

any other three-dimensional model. It was also better than the one-dimensional model. Third, the model had excellent fit indexes in the pooled sample (SRMR = 0.042, GFI = 0.96, AGFI = 0.93, CFI = 0.96, and IFI = 0.96). The factor correlations ranged from 0.35 to 0.48, and the composite reliability ranged from 0.82 to 0.88. In summary, the pooled sample confirmed the identical factor structure for the model as was found in the individual and multigroup analysis, which is strong evidence of the universality of the items.

#### 5.4. Measure of multidimensional brand equity (MBE) and its index

We suggest this 10-item measure of MBE as a scale of consumer-based brand equity. Because of the cross-cultural invariance, the scores of the MBE and its dimensions can be compared cross-culturally, and the different scores may be considered indicative of true cross-cultural differences in the constructs.

Adding up the raw scores of the 10 items of the MBE may not be an appropriate way to develop a MBE index, because they are not evenly distributed among the three dimensions. More important, the three dimensions may contribute differently to brand equity. To develop the formula for a single MBE index, the relationships between the dimensions and brand equity should be considered. Therefore, we generated the higher-order three-dimensional model that comprises the same dimensions and loading specifications as the MBE three-dimensional measurement model. The higher-order model is equivalent to the MBE model because the intercorrelational paths of the MBE model can be converted into the causal paths of the higher-order model without adding any new path or deleting any existing path (Stelzl, 1986). In the higher-order model, the three dimensions are related to a higher-order factor, which can be named “higher-order brand equity.” The fit indexes remain the same between these two different models because they are statistically equivalent.

All the causal paths of higher-order brand equity to the dimensions were significant at the 0.0001 level. The smallest *t*-value of the paths was 10.88 for Americans, 5.44 for Korean Americans, and 7.41 for Koreans. The path coeffi-

cient of brand equity for brand loyalty was 0.60 for Americans, 0.56 for Korean Americans, and 0.69 for Koreans;

Table 5  
The MBE index (standard deviation) by brand

	n	MBE index <sup>a</sup>	Brand loyalty	Perceived quality	Brand awareness/associations
<i>Americans</i>					
Camera films		92.36**** <sup>b</sup>	28.64****	35.76****	95.01****
Agfa	41	2.37 (0.44)	1.96 (0.73)	3.09 (0.25)	1.79 (0.83)
Fuji	40	3.14 (0.37)	2.11 (0.77)	3.40 (0.57)	3.80 (0.67)
Kodak	52	3.79 (0.53)	3.27 (0.97)	3.97 (0.56)	4.06 (0.57)
Konica	44	2.64 (0.40)	2.01 (0.72)	3.17 (0.37)	2.51 (0.87)
Athletic shoes		27.42****	15.28****	16.63****	8.63****
Adidas	51	3.08 (0.49)	2.01 (0.79)	3.44 (0.53)	3.65 (0.83)
Asics	46	2.97 (0.46)	2.01 (0.67)	3.34 (0.46)	3.43 (0.98)
LA Gear	44	2.87 (0.40)	1.84 (0.89)	3.18 (0.58)	3.49 (0.75)
Nike	49	3.82 (0.51)	3.01 (0.80)	4.09 (0.54)	4.26 (0.56)
Puma	50	2.85 (0.55)	1.88 (0.79)	3.14 (0.71)	3.43 (0.88)
Reebok	52	3.34 (0.52)	2.42 (0.85)	3.58 (0.70)	3.95 (0.71)
Television sets		62.13****	24.19****	25.97****	37.67****
Samsung	48	2.67 (0.53)	1.94 (0.79)	3.21 (0.61)	2.65 (1.03)
Sony	52	3.46 (0.48)	2.76 (0.88)	3.82 (0.59)	3.67 (0.59)
<i>Korean Americans</i>					
Camera films		23.26****	16.23****	7.61***	19.82****
Agfa	22	2.59 (0.52)	1.98 (0.85)	3.05 (0.62)	2.35 (1.12)
Fuji	23	3.08 (0.33)	2.00 (0.75)	3.48 (0.57)	3.60 (0.62)
Kodak	21	3.65 (0.59)	3.37 (0.71)	3.69 (0.70)	3.93 (0.60)
Konica	18	2.68 (0.31)	2.30 (0.66)	2.92 (0.43)	2.68 (0.58)
Athletic shoes		19.03****	12.82****	11.78****	4.18**
Adidas	35	3.18 (0.57)	2.17 (0.86)	3.49 (0.65)	3.81 (0.82)
Asics	20	2.95 (0.41)	2.20 (0.71)	3.25 (0.38)	3.26 (1.19)
LA Gear	31	2.79 (0.38)	1.90 (0.73)	3.10 (0.51)	3.26 (0.71)
Nike	24	3.66 (0.46)	3.08 (0.70)	3.77 (0.44)	4.18 (0.64)
Puma	32	2.49 (0.52)	1.52 (0.60)	2.66 (0.80)	3.40 (1.15)
Reebok	25	3.07 (0.44)	2.09 (0.81)	3.46 (0.64)	3.50 (0.81)
Television sets		16.90***	9.80**	16.62***	3.56
Samsung	24	2.80 (0.34)	2.13 (0.67)	3.04 (0.41)	3.17 (0.56)
Sony	26	3.44 (0.68)	2.83 (0.90)	3.75 (0.75)	3.55 (0.83)
<i>Koreans</i>					
Camera films		8.20****	10.16****	1.79	2.71*
Agfa	55	2.52 (0.44)	2.04 (0.63)	2.95 (0.47)	2.75 (0.72)
Fuji	53	2.61 (0.48)	2.07 (0.70)	3.03 (0.56)	2.93 (0.75)
Kodak	53	2.87 (0.52)	2.63 (0.77)	3.11 (0.47)	2.96 (0.64)
Konica	49	2.43 (0.47)	1.98 (0.64)	2.90 (0.52)	2.58 (0.97)
Athletic shoes		7.43****	2.69*	3.39**	9.52****
Adidas	47	2.70 (0.48)	1.87 (0.64)	3.04 (0.56)	3.55 (0.92)
Asics	53	2.49 (0.52)	1.69 (0.65)	2.91 (0.71)	3.22 (0.73)
LA Gear	50	2.32 (0.44)	1.67 (0.61)	2.94 (0.42)	2.58 (0.93)
Nike	54	2.78 (0.54)	2.05 (0.81)	3.20 (0.64)	3.38 (0.73)
Puma	53	2.35 (0.47)	1.69 (0.60)	2.82 (0.52)	2.81 (0.92)
Reebok	57	2.64 (0.54)	1.86 (0.74)	3.15 (0.64)	3.22 (0.79)
Television sets		4.90*	7.50**	1.83	6.96**
Samsung	55	2.78 (0.55)	2.41 (0.76)	3.21 (0.59)	2.83 (0.75)
Sony	52	2.54 (0.54)	2.00 (0.78)	3.37 (0.60)	2.41 (0.90)

Notes to Table 5:

<sup>a</sup> The American MBE index = 0.296 (the mean of brand loyalty) + 0.414 (the mean of perceived quality) + 0.290 (the mean of brand awareness/associations); the Korean American MBE index = 0.289 (the mean of brand loyalty) + 0.491 (the mean of perceived quality) + 0.220 (the mean of brand awareness/associations); and the Korean MBE index = 0.411 (the mean of brand loyalty) + 0.315 (the mean of perceived quality) + 0.274 (the mean of brand awareness/associations).

<sup>b</sup> ANOVA results for mean differences among brands by product category.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

\*\*\*\*  $p < 0.0001$ .

0.84, 0.95, and 0.53 for perceived quality; and 0.59, 0.43, and 0.46 for brand awareness/associations. These coefficients become the weights of the dimensions when computing the MBE index. Then, the weight of a dimension is the portion of the path coefficient of that dimension in the sum of the three path coefficients. For example, among American consumers, the weight of brand loyalty is 0.296, which comes from  $0.60/(0.60 + 0.84 + 0.59)$ . Table 5 illustrates the application of the MBE formula on the 12 brands. Across cultures, Nike and Kodak were the highest in the MBE index and in every brand equity dimension. Sony received higher evaluations than Samsung in the American market, but Koreans preferred Samsung to Sony. As apparent collectivists (Hofstede, 1991), they might have shown high consumer ethnocentrism, favoring their domestic product over the import.

Further analysis found that the MBE index was highly correlated to a composite score computed from a simple sum of the mean scores of the three dimensions. The correlation between the MBE index and the mean score composite was 1.00 for Americans, 0.98 for Korean Americans, and 0.99 for Koreans. The other composite score, made from a sum of the raw scores of the 10 items, was also highly correlated to the MBE index. The correlation between the MBE index and the raw score composite was 0.97 for Americans, 0.91 for Korean Americans, and 0.94 for Koreans. These results suggest that the composite score based on the mean or raw scores can be used as an excellent proxy for the MBE index, in particular in non-Korean or non-American countries.

### 5.5. Construct validity

We compared the MBE with purchase intention and attitude toward brands for validity purposes. Practically, purchase intention and brand attitude have been used as surrogates for brand equity (e.g., Agarwal and Rao, 1996). Although brand equity may not be conceptually equivalent to intention and attitude (e.g., Rangaswamy et al., 1993; Swait et al., 1993; Park and Srinivasan, 1994), a strong relationship between the constructs has been expected (Aaker, 1991; Keller, 1993). Thus, a high correlation reveals the construct validity of the MBE. Both purchase intention and brand attitude measures show high reliability. The reliability of the two-item measure of purchase intention was 0.90 for Americans, 0.90 for Korean Americans, and 0.80 for Koreans; and the reliability of the five-item measure of attitude toward brand was 0.93, 0.94, and 0.90. The prediction of a highly positive correlation between brand equity and purchase intention was supported with correlations of 0.66, 0.70, and 0.55 ( $p < 0.0001$ ) for Americans, Korean Americans, and Koreans, respectively. The correlation between brand equity and brand attitude was also high: 0.72, 0.71, and 0.50 ( $p < 0.0001$ ) for Americans, Korean Americans, and Koreans, respectively. These findings demonstrate strong construct validity of the MBE.

### 5.6. Convergent validity with a measure of overall brand equity (OBE)

For a convergent validity check of the MBE, using the same participants we developed a four-item unidimensional measure of brand equity, which is a measure of OBE. We generated 18 candidate items for OBE on the basis of our definition of brand equity. We worded each item to compare a focal brand with its counterpart, which was a brand without a name but with identical product characteristics such as physical attributes, quality, and price. Other factors being equal, the difference in consumer response between the focal brand and the counterpart can be interpreted as the brand equity of the focal brand.

After multistep examinations of the 18 candidate items, 4 items survived to form the OBE. Examples of the items include “It makes sense to buy Brand X instead of any other brand, even if they are the same” and “Even if another brand has the same features as Brand X, I would prefer to buy Brand X.” The items are reported in Appendix A. The reliability of the OBE was 0.90, 0.89, and 0.90 for Americans, Korean Americans, and Koreans, respectively. The correlation between the OBE and the MBE index was 0.60, 0.63, and 0.59 ( $p < 0.0001$ ) for Americans, Korean Americans, and Koreans, respectively. This high correlation supports the convergent validity of the MBE.

## 6. Discussion

The purpose of this research is to develop a psychologically sound and cross-culturally generalizable measure of brand equity by testing Aaker’s (1991) and Keller’s (1993) conceptualizations. Our etic measure of MBE comprises 10 items representing the three dimensions of brand loyalty, perceived quality, and brand awareness/associations.

This study has important practical and theoretical implications that benefit brand equity research in several ways. First, the measure can be used to examine how consumer-based brand equity results from its potential antecedents, such as brand knowledge, purchase and consumption experience, marketing activity, corporate image, and environmental factors. Similarly, the consequences of brand equity may be efficiently investigated using the measure. In particular, the impact of each dimension of the MBE on consequent variables needs to be identified. As a result, nomological relationships between brand equity and its relevant variables may be studied more efficiently.

Second, the measure can expedite studies of brand name values and extensions. For example, the measure would be useful in examining the equity of cobrands. It may be used to measure the equity of each brand separately, before and after cobranding, and the brand equity of the cobrand. In addition, the measure may be used for studying how brand equity affects brand extension and to help explain how customers use the brand equity of parent

brands to develop preference among different extensions (Sullivan, 1998).

Third, there may exist a potential causal order among the dimensions of brand equity. For example, the hierarchy of effects model suggests that brand awareness and associations precede perceived quality and that perceived quality precedes brand loyalty (Levidge and Steiner, 1961). Perception of high product quality leads to brand loyalty because it is the basis of consumer satisfaction (Oliver, 1997). If a strong ordering exists among the dimensions, to manage resources more efficiently, managers should consider strategies that focus on the timing of the dimensions.

Fourth, the measure is not only valid and reliable, but also parsimonious, which helps practitioners track brand equity of individual brands on a regular basis. By assessing the facets of brand equity, the measure appears to be a less confounded way of measuring brand equity. When practitioners use the measure as a tool for evaluating and tracking brand performance over time, they may understand clearly in which area the brand succeeds or fails. Thus, they can make an efficient allocation of resources to maintain a balance among the brand equity dimensions. By tracking the progress of target products' brand equity and dimensions over time, managers will have a better understanding of the long-run effect of their efforts. As they understand the dynamics between marketing efforts and brand equity, managers may set a reasonable goal for building brand equity (Yoo, Donthu, and Lee, 2000). In addition, they may track the relationships between brand equity and business consequences such as market share, sales, and profits.

Fifth, the extent to which the measure is cross-culturally generalizable is somewhat limited. Although the factor loadings are invariant across samples, the factor intercorrelations are not, which means that different cultures place different levels of importance on the dimensions of brand equity. The higher-order model analysis shows perceived quality is the most important factor among Americans and Korean Americans, whereas brand loyalty is the most important among Koreans. This may result from cultural differences, implying that brand equity-related marketing strategies need to focus more on different dimensions of brand equity in different cultures.

### 6.1. Further research

Scales are established by "conventions or agreements among scientists about a good scaling" (Nunnally and Bernstein, 1994, p. 24). Our study should spur researchers to revise and revalidate our scale. We suggest two major directions for further research. First, the three dimensions of brand equity may be extended into subdimensions. This will help clarify the structure of brand equity in detail. For example, the five dimensions of Aaker's (1997) brand personality construct (sincerity, excitement, competence, sophistication, and ruggedness) may be related to our awareness/associations dimension. Also, brand loyalty

may be further divided into cognitive, affective, conative, and action loyalty (Oliver, 1997).

Second, the measure should have higher external generalizability. Additional research should validate the measure using different types of products, such as services and industrial goods. The measure also should be extended to test how it can be applied to corporate or organizational equity, retail equity, and chain equity. Also, the relationship between dollar-metric brand equity and our consumer-based brand equity requires should be examined. In addition, the measure must to be validated among non-student samples. Researchers may worry about using students for brand equity research because older consumers' psychological attachments to brand names may vary markedly from students, for several reasons (e.g., differences in length of exposure to the brand, nostalgic associations with the brand, information processing abilities). In a strict sense, the scale may be generalizable across only the three samples that participated in the study. When more cultures are involved in further research, a more etic scale of brand equity can be developed.

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### Appendix A. Brand equity items and their means (standard deviations)

Item	Americans	Korean Americans	Koreans
<i>Ten-item MBE</i>			
Brand loyalty			
LO1. I consider myself to be loyal to X. <sup>a</sup>	2.26 (1.05)	2.27 (1.00)	2.00 (0.84)
LO2. X would be my first choice.	2.39 (1.08)	2.34 (1.09)	1.99 (0.84)
LO3. I will not buy other brands if X is available at the store.	2.22 (0.99)	2.17 (0.96)	2.00 (0.84)
Perceived quality			
QL2. The likely quality of X is extremely high.	3.38 (0.72)	3.22 (0.77)	3.04 (0.63)
QL3. The likelihood that X would be functional is very high.	3.57 (0.69)	3.38 (0.76)	3.06 (0.63)
Brand awareness/associations			
AW2. I can recognize X among other competing brands.	3.49 (1.21)	3.49 (1.19)	3.13 (1.14)
AW3. I am aware of X.	3.71 (1.20)	3.71 (1.13)	2.59 (1.00)
AS1. Some characteristics of X come to my mind quickly.	3.14 (1.20)	3.15 (1.19)	2.64 (1.11)
AS2. I can quickly recall the symbol or logo of X.	3.37 (1.28)	3.31 (1.25)	3.19 (1.18)
AS3. I have difficulty in imagining X in my mind. (r) <sup>b</sup>	3.41 (1.20)	3.45 (1.15)	3.13 (1.04)
<i>Four-item OBE</i>			
OBE1. It makes sense to buy X instead of any other brand, even if they are the same.	2.58 (0.90)	2.63 (0.91)	2.38 (0.86)
OBE2. Even if another brand has the same features as X, I would prefer to buy X.	2.63 (0.92)	2.78 (0.93)	2.35 (0.85)
OBE3. If there is another brand as good as X, I prefer to buy X.	2.58 (0.90)	2.72 (0.91)	2.15 (0.74)
OBE4. If another brand is not different from X in any way, it seems smarter to purchase X.	2.64 (0.86)	2.79 (0.94)	2.24 (0.77)

<sup>a</sup> X indicates a brand name.

<sup>b</sup> (r) indicates reversed scoring.