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Testing for Measurement Invariance of Fashion Brand Equity

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패션브랜드 자산 측정모델의 등치테스트에 관한 연구

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Abstract

Simon and Sullivan(1993) estimated that clothing and textile related brand equity had the highest magnitude comparing any other industry category. It reflects that fashion brands reinforce the symbolic, social values and emotional characteristics being different from generic brands. Recently, Kim and Lim(2002) developed a fashion brand equity scale to measure a brand's psychometric properties. However, they suggested that additional psychometric tests were needed to compare the relative magnitude of each brand's equity. The purpose of this study was to recognize the psychometric constructs of fashion brand equity and validate Kim and Lim's fashion brand equity scale using the measurement invariance test of cross-group comparison. First, we identified the constructs of fashion brand equity using confirmatory factor analysis through structural equation modeling. Second, we compared the relative magnitude of two brands' equity using the measurement invariance test of multi-group simultaneous factor analysis. Data were collected at six major universities in Seoul, Korea. There were 696 usable surveys for data analysis. The results showed that fashion brand equity was comprised of 16 items representing six dimensions: customer-brand resonance, customer feeling, customer judgment, brand imagery, brand performance and brand awareness. Also, we could support the measurement invariance of two brands' equities by configural and metric invariance tests. There were significant differences in five constructs' mean values. The greatest difference was in customer feeling; the smallest, in customer judgment.

Key words: Multi-group simultaneous confirmatory factor analysis, Fashion brand equity, Invariance test, Measurement model, Structural equation modeling; 확증적 요인분석, 패션 브랜드 자산, 등치테스트, 측정모델, 구조방정식 모형

I. Introduction

Brand researchers have found nearly 80 terms for the concept of marketing asset for which brand equity is the most common name(Amber, 2001). According to Blackson(2000), one of the first definitions of brand equity was defined by David Olgilvy as the consumer's idea of a product. Brand equity measures the value of a brand and the effectiveness of the firm's marketing mix activities as evidenced by consumer behavior toward the brand (Faircloth et al., 2001).

Numerous studies have attempted to determine the value of brand equity(Crimmins, 2000; Kamakura and Russell, 1993; Lane and Jacobson, 1995; Park and Srinivasan, 1994; Simon and Sullivan, 1993) or

to examine the structure and composition of the construct for marketing purposes(Chaudhuri and Holbrook, 2001; Dyson et al., 1996; Krishnan, 1996; Yoo et al., 2000). However, few studies have examined the psychometric properties of the brand equity phenomena(Cobb-Walgren et al., 1995; Erdem and Swait, 1998; Leuthesser et al., 1995).

Fashion brands provide visible cues that reflect a consumer's identity, lifestyle, and interests. These inherent attributes result in intense competition and conspicuous consumption. Therefore, fashion brands reinforce the symbolic, social values and emotional characteristics being different from generic brands. Simon and Sullivan(1993) estimated that clothing and textile related brand equity had the highest magnitude comparing any other industry category. Few researchers(Choi and Rhee, 2001; Kim and Rhee, 1999; Rhee, 2000) have attempted to measure brand equity of fashion brands. Recently, Kim and Lim (2002) developed a fashion brand equity scale to measure a brand's psychometric properties. They proposed that fashion brand equity was a building process based on consumers' perceptions. They identified that the customers' emotion and judgment impacted their customer-brand resonance that was the final outcome of fashion brand equity. Customers' emotion and judgment were developed from brand imagery and brand performance based on brand awareness. However, they suggested that additional psychometric tests were needed to compare the relative magnitude of each brand's equity.

Therefore, we recognized the necessity of an invariance test to compare the magnitude of brand equity simultaneously. In other words, we compared the mean value of each construct of brand equity after testing if the measure was conceptually and metrically equivalent across groups. In order for such comparisons to be meaningful, however, the instruments used to measure the theoretical constructs of interest have to exhibit adequate across group equivalence. On reviewing the various forms of measurement invariance in multi-group consumer research, there is general agreement that the multi-group confirmatory factor analysis model represents the most powerful and versatile approach to testing for cross-sample measurement invariance(Steenkamp and Baumgartner, 1998).

The purpose of this study was twofold: (a) identify the psychometric constructs of fashion brand equity; (b) validate the scale using the measurement invariance test of cross-group comparisons. First, we identified the constructs of fashion brand equity using confirmatory factor analysis through structural equation modeling. Second, we compared the relative magnitude of two brands' equity using the measurement invariance test of multi-group simultaneous factor analysis.

II. Literature Review

1. Customer-Based Fashion Brand Equity

Brand equity is the incremental utility and value added to a product by its brand name(Kamakura and Russell, 1993; Park and Srinivasan, 1994; Yoo et al., 2000). Researchers have recognized the benefits of building brand equity including that of future profits (Srivastava and Shocker, 1991). Yoo and Donthu, (2001) summarized that building a strong brand with great equity provides a host of possible benefits to a firm, such as 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 (Amber, 1997).

Brand equity can be discussed from the perspective of the investor, the manufacturer and the retailer; however, there is value to the investor, the manufacturer, and the retailer only if there is value to the consumer(Crimmins, 2000; Farquar, 1989). Customer-based brand equity is defined as the differential effect of brand knowledge on consumer response to the marketing of the brand and occurs when the consumer holds favorable brand associations(Keller, 1993). Keller(1998) stated, "Though the eventual

goal of any marketing program is to increase sales, it is first necessary to establish knowledge structures for the brand so that consumers respond favorably to marketing activities for the brand" (p.8). Conceptualizing brand equity from this perspective is useful because it suggests both specific guidelines for marketing strategies, tactics and areas where research can be useful in assisting managerial decision-making.

Researchers have used various methods for measuring brand equity from a customer-perspective such as an equalization price measure(Swait et al., 1993), brand value measure(Kamakura and Russell, 1993), and consumer preference-based measure (Park and Srinivasan, 1994). Krishnan(1996) used a memory network model to identify brand association characteristics underlying brand equity. Aaker (1996) combined customer perception with market behavior to develop the Brand Equity Ten consisting of ten sets of measures grouped into five categories. The first four categories represent customers' perceptions of the brand along the four dimensions of brand equity; loyalty, perceived quality, associations, and awareness. The fifth includes two sets of market behavior measures that represent market-based information rather than customers' perceptions. However, these measures were developed without rigorous psychometric tests and adequate explanation(Yoo and Donthu, 2001).

For a mature brand, any single measure is unlikely to capture the full range of its equity. Hence, a multitude of measures that reflect several dimensions of equity would be appropriate(Krishnan, 1996). Agarwal and Rao(1996) compared eleven different consumer-based brand equity measures and evaluated their convergence. Recently Keller(2001) suggested a comprehensive new approach, the Customer-Based Brand Equity model(CBBE). The model posits that the power of a brand lies in what customers have experienced over time and their perceptions of the brand. The power of the brand is the perception in the minds' of consumers. The CBBE model prescribes a series of sequential steps for brand building which range from establishing the proper identity, creating the appropriate meaning, eliciting the right response, to forging relationships with consumers. The CBBE model depends upon awareness, performance, imagery, judgments, feelings, and resonance. A key to a successful brand is forming a harmonious relationship between the brand and the consumer who views the brand as relevant.

In order to integrate varied measures of the CBBE model, Kim and Lim(2002) developed a framework that links the stages through which a consumer passes. They selected six constructs that relate to the different stages of brand building. The framework is presented in (Fig. 1).

Brand awareness

According to Aaker(1991), brand awareness is the ability of potential buyers to recall the brand from its product category. Customers with brand awareness understand the product within the category where

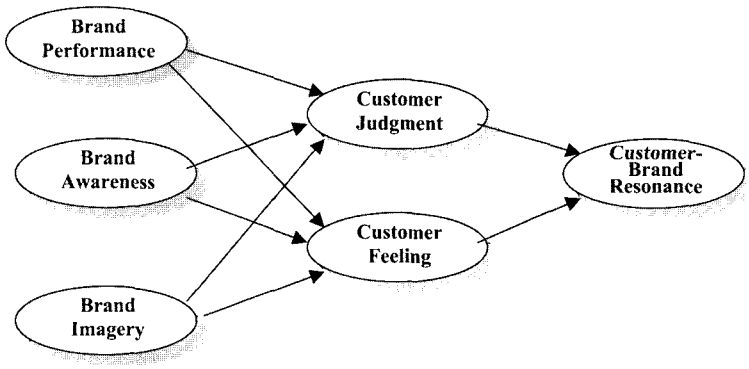

Fig. 1. Conceptual Framework of Fashion Brand Equity.

the brand competes and can link products sold under the brand name(Keller, 2001). Brand awareness influences the formation and strength of brand associations and ultimately impacts consumers' purchase decisions(Keller, 1993).

Brand performance

The product is at the core of brand equity. Brand performance is the way the product meets customers' needs. It is the primary influence of what consumers experience and what the firm and other customers tell them about the brand. It refers to the intrinsic properties of the brand, including inherent product characteristics(Keller, 2001).

Brand imagery

To give meaning to a brand, it's important to create a brand image and establish brand characteristics from the customer's viewpoint. Although numerous brand associations are possible, brand meaning broadly can be distinguished in terms of more functional, performance-related considerations versus abstract, imagery-related considerations(Keller, 2001). Aaker(1991) defined brand image as a set of associations, usually organized in some meaningful way. Brand meaning involves brand imagery, which deals with the extrinsic properties of the product, including the ways the brand attempts to meet customer's more abstract psychological or social needs(Keller, 2001).

Customer judgment

Brand judgments focus on customers' personal opinions about the brand relative to their performance and imagery associations. Keller(2001) suggested that customers might make all types of judgments with respect to a brand, but four types of summary judgments are particularly crucial to creating a strong brand including quality, credibility, consideration, and superiority. Therefore, consumer judgment is based upon their subjective evaluations of product quality. Perceived quality is the consumers' judgment about a product's overall excellence or superiority(Zeithaml, 1988).

Customer feeling

When consumers employ the affect-referral heuristic, they base their choice on their overall emotional response to an alternative. Rather than examining attributes or their perception about attributes, they use a holistic approach in which they choose the alternative which elicits the most positive feeling. When making a purchase, consumers may not go through an extended or even a limited decision process but rely solely on their feelings(Hoyer, 1984). Depending on the nature of the consumption experience, companies may find it beneficial to position their products based on feelings experienced during consumption. There are two basic approaches for positioning the product in terms of consumption feelings. One approach is to focus on the positive feelings that consumption provides. The second approach is to emphasize how the product reduces or eliminates negative feelings(Blackwell et al., 2001).

Customer-brand resonance

Customer-brand resonance occurs when awareness, performance, imagery, judgment and feeling are synchronized with customer needs, wants, and desires. Brand resonance refers to the nature of the relationship customers have with the brand and whether they feel in touch with the brand. It is characterized by the depth of the psychological bond which customers have with the brand as well as how much activity this loyalty engenders. Brand resonance is comprised of behavioral loyalty, attitudinal attachment, sense of community, and active engagement. The benefits of achieving resonance and affinity with their customers are greater price premiums and more efficient, effective marketing programs(Keller, 2001).

2. Measurement Invariance

When using structural equation modeling, a numerous issues arise as researchers begin to explore the extent of invariance when a measurement device is applied to a new validation group(Griffin et al., 2000). A key issue is the degree of measurement invariance that exists when a scale is applied to a new population.

Measurement invariance refers to "whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attributes" (Horn and McArdle, 1992).

The relationship between observed variables and hypothesized underlying constructs can be modeled using the confirmatory factor analysis (here after CFA) (Bollen, 1989). In the CFA model, the observed response χ_i to an item i ($i = 1, \ldots, p$) is typically represented as a linear function of latent construct ξ_j ($j = 1, \ldots, m$), an intercept τ_i, and a stochastic error term δ_i. Thus,

$$\chi_i = \tau_i + \lambda_{ij}\xi_j + \delta_i \quad (1)$$

where λ_{ij} is the slope of the regression of χ_i on ξ_j. The slope coefficient, or factor loading, defines the metric of measurement, as it shows the amount of change in χ_i due to a unit change in ξ_j. The intercept τ_i, in contrast, indicates the expected value of χ_i when $\xi_j = 0$ (Sörbom, 1974).

To identify the model, the latent constructs have to be assigned a scale in which they are measured. In multi-group analysis, this is performed by setting the factor loading of one item per factor to one; the identification problem should not be solved by standardizing the variance of the ξ_j (Cudeck, 1989). Items for which loadings are fixed at unity are referred to as marker(or reference) items. The same item(s) should be used as marker item(s) in each group by testing configural, metric and scalar invariance (Steenkamp and Baumgartner, 1998).

Configural Invariance

The configural approach is based on Thurstone's principle of simple structure(Steenkamp and Baumgartner, 1998). In essence, this principle states that the pattern of salient(nonzero) and nonsalient(zero or near zero) loadings defines the structure of the measurement instrument. In terms of factorial invariance, the principle of simple structure implies that the items comprising the measurement instrument should exhibit the same configuration of salient and nonsailent factor loadings across groups(Horn and McArdle, 1992). Thus, configural invariance can be tested by identifying the same factor pattern or structure across groups.

Metric Invariance

Configural invariance does not indicate that people in different groups respond in the same way, in the sense that obtained ratings can be meaningfully compared across groups. Metric invariance provides for a stronger test of invariance by introducing the concept of equal metrics or scale intervals across groups (Rock et al., 1978). If an item satisfies the requirement of metric invariance, different scores on the item can be meaningfully compared across groups, and these observed item differences are indicative of group differences in the underlying construct. Because factor loadings carry information about how changes in latent and observed scores, metric invariance can be tested by constraining the loadings to be same across groups(Steenkamp and Baumgartner, 1998).

$$\lambda^1 = \lambda^2 = \ldots = \lambda^G \quad (2)$$

Scalar invariance

Configural and metric invariance required information about the covariation of the items in different groups. However, it is also important to conduct mean comparisons across groups. In order for such comparisons to be meaningful, scalar invariance of the items is required(Meredith, 1993). We use the term "scalar invariance" to refer to the equality of measurement intercepts. Scalar invariance implies that cross-group differences in the means of the observed items are due to differences in the means of the underlying constructs. Comparisons of group means based on such additively biased items are meaningless unless this bias is removed from the data(Steenkamp and Baumgartner, 1998). Scalar invariance is tested by imposing the following additional constraint on the model of metric invariance:

$$\tau^1 = \tau^2 = \ldots = \tau^G \quad (3)$$

III. Research Method

1. Item Purification

In order to maximize conditions for the model to

be properly tested, the test product was selected to fit a number of criteria. First, market penetration of the company's products has to be sufficient to gain consumer awareness(Kirmani and Zeithaml, 1993; Na et al, 1999). The product category should be mature to ensure that consumers recognize all the brands with which it competes. Thus, we determined the product category to be casual wear. To compare brand equities between two casual brands, we chose Giordano and Polo, which are market leaders of casual wear in South Korea. The brands were selected on the basis of secondary data using the Korea Brand Power Index(K-BPI) of 2001 and 2002.

The measures for customer-based brand equity were refined in a two- stage process. In the first survey, 579 respondents representing three universities completed self-administered questionnaires. The students evaluated 126 items for each brand on a 7-point Likert scale(1=Strongly disagree, 7=Strongly agree). In order to reduce items, the principal component extraction method using varimax rotation scheme was used. Therefore, we retained 41 items for initial psychometric assessment which yielded six factors(eigenvalues: 7.94, 4.71, 3.71, 3.45, 2.25, 1.56) explaining 57.61% of variance. We computed the reliability of the items of each construct.

The second survey was conducted to refine the instrument and confirm the constructs of fashion brand equity. Respondents(N=326) evaluated 41 items according to two brands on a 7-point Likert scale. The results of exploratory factor analysis with varimax rotation yielded four factors consisting of 29 items(eigenvalues: 6.26, 5.28, 3.97, 2.38) that explained 61.68% of variance. Each factor's reliability(α=0.93, 0.88, 0.89, 0.67) exceeded the criteria outlined in Bearden et al.(1991). Given the importance of the above factor solutions, a further check of their discriminant validity was warranted. Discrimination is achieved when each between-factor correlation is less than one, by an amount greater than twice the standard error(Bagozzi and Baumgartner, 1994)(Table 1). As a result, the scale contained 29 items to measure fashion brand equity and one design-related item(i.e.,The product of brand X provides a good design) was added reflecting an important fashion brand attribute.

Table 1. Correlation Matrix Between Factors.

	Resonance	Judgment/ Performance	Feeling/ Image	Awareness
Resonance	1.000			
Judgment/ Performance	.675	1.000		
Feeling/Image	.582	.688	1.000	
Awareness	.467	.501	.565	1.000

2. Data Collection

Data were collected at six major universities in Seoul, Korea. The self-administered questionnaire consisted of 30 fashion brand equity items and eight questions eliciting demographic characteristics(e.g., age, gender, name of university, grade, major, a place of residence, monthly income, and monthly clothing cost). Respondents completed the self-administered questionnaire and evaluated two brands equities independently. Two versions of the questionnaire were assigned randomly to participants, avoiding order bias. There were 696 usable surveys for data analysis. The average age of the respondents was 20.5 years. Forty-seven percent were male and 53% were female.

3. Data Analysis

The conceptual framework of this research consisted of six latent variables which were causally related to brand equity: customer-brand resonance, customer feeling, customer judgment, brand imagery, brand performance, and brand awareness. The purpose of this study was to compare the magnitude of the mean value of the six constructs according to two brands. Therefore, statistical analyses were performed using confirmatory factor analysis and measurement invariant test in structural equation modeling with AMOS 4.0 program(Arbuckle and Wothke, 1999).

IV. Result

1. Confirmatory Factor Analysis

The initial confirmatory factor analysis(CFA), using maximum likelihood, was employed as the data analysis tool to detect the unidemensionality of each construct. Unidemensionality is evidence that a single trait underlies a set of constructs(Gerbing and Anderson, 1988). We validated the scale in each sample following traditional scale validation procedures(Gerbing and Anderson, 1988). In other words, we explored whether a similar pattern of internal consistency and dimensionality among brand equity items could be found in each of the two brands. We selected items for each construct until no higher reliability could be achieved and obtained the same items across brands. As a result, we used 16 items to test the measurement invariance for the fashion brand equity: customer-brand resonance(4 items), customer judgment(3 items), customer feeling(3 items), brand performance(2 items), brand imagery (2 items), and brand awareness(2 items).

Standardized factor loading estimates resulting from the six factor measurement model using the Polo and Giordarno samples are shown in (Table 2). For comparison purposes, we note that the CFA among Polo sample suggests a good fit overall [χ^2 =392.8, d.f. = 86, CFI(comparative fit index)=0.955, RMSEA (root mean square of approximation)=0.072, PNFI (parsimony-adjusted normed fit index)=0.676, AIC (Akaike information criterion)=492.8]. The result also shows adequate reliability estimates for the six values (coefficient α of 0.90~0.66) with all factor loadings significant(all t values exceed 3.2, p<.001).

The Giordano sample CFA was conducted with the 16 items restricted to load on one of six factors as described in the Polo measurement. The result suggests a good fit overall(χ^2= 576.9, d.f. = 86, CFI = 0.919, RMSEA = 0.091, PNFI = 0.646, AIC = 676.9). The result also shows adequate reliability estimates for the six values(α of 0.87~0.66) with all factor loadings significant(all t values exceed 3.2, p<.001) demonstrating adequate convergent validity.

Discriminant validity is supported when the Average Variance Extracted (AVE), between each pair of constructs is greater than Φ^2(i.e., the squared correlation between two constructs). This criterion is considered the most stringent test of discriminant validity and was met for all possible construct pairs (Maxham and Netemeyer, 2002). See(Table 2).

2. Comparing Measurement Invariance Models

To estimate the significance of mean differences, we conducted configural, metric, and scalar invariance tests to the initial CFA model(Steenkamp and Baumgartner, 1998). Theoretically, a scale that retains psychometric properties across the group in which it is applied would be considered to have full measurement invariance(Griffin et al., 2000). However, psychometric researchers suggest that the ideal case of full measurement invariance is impractical and unnecessary for substantive applications and propose partial measurement invariance as an appropriate goal(Byren et al., 1989; Griffin et al., 2000). Byrne et al.(1989) proposed the concept of partial measurement invariance. Partial measurement invariance as used by these authors applies to factors that are configurally invariant. In particular, they argued that full metric invariance was not necessary in order for further tests of invariance and substantive analyses, such as comparisons of factor means, to be meaningful, provided that at least one item(other than the one fixed at unity to define the scale of each latent construct) was metrically invariant.

Configural invariance model assumed the same factor pattern(the number of factors and item loadings to factor) of CFA comparing two brands estimations. The fit of the configural invariance model was satisfactory because two brands had the same factor structure, which was statistically invariant between two brands by comparing an unconstrained and a constrained model. See (Table 3). The chi-square was significant($\chi^2_{(172)}$ = 969.800, p<.001) due to the large sample size, and the RMSEA of 0.058 indicated an acceptable fit. Two other practical fit indices were also above the commonly recom-

Table 2. Initial Measurement Model Results.

Fit Indices	χ^2	df	GFI	CFI	PNFI	RMSEA
Polo	392.839	86	.933	.955	.676	.072
Giordano	579.960	86	.908	.919	.646	.091

Internal Consistency		Mean (SD)		Factor loading		Average variance extracted	
	Factor	Polo	Giordano	Polo	Giordano	Polo	Giordano
Resonance							
Re1	Behavioral loyalty	3.07(1.70)	3.29(1.51)	.905	.885	.70	.61
Re2	Attitudinal attachment	3.32(1.72)	3.26(1.02)	.912	.890		
Re3	Consideration set	4.14(1.71)	3.77(1.58)	.772	.707		
Re4	Premium price	3.16(1.69)	2.58(1.24)	.758	.589		
Judgment							
Jd1	Credibility	4.81(1.28)	4.36(1.17)	.891	.849	.75	.70
Jd2	Perceived quality	4.70(1.26)	4.13(1.170	.894	.836		
Jd3	Superiority	4.52(1.26)	3.76(1.19)	.817	.816		
Feeling							
Fe1	Self respect	4.54(1.46)	3.09(1.19)	.798	.710	.67	.62
Fe2	Positive feeling	4.80(1.36)	3.82(1.26)	.856	.880		
Fe3	Social approval	4.83(1.41)	3.54(1.22)	.796	.764		
Performance							
Pe1	Product reliability	4.91(1.27)	3.79(1.27)	.745	.729	.51	.52
Pe2	Style and design	4.84(1.22)	4.02(1.18)	.668	.704		
Imagery							
Im1	User profile	4.76(1.52)	3.99(1.51)	.740	.733	.50	.49
Im2	Purchase and usage Situations	5.37(1.43)	4.84(1.54)	.673	.660		
Awareness							
Aw1	Category identification	6.02(1.01)	5.23(1.32)	.849	.860	.61	.55
Aw2	Recognition	6.33(1.03)	6.20(1.13)	.701	.592		

Measurement Model Correlation Matrix	Resonance	Judgment	Feeling	Performance	Imagery	Awareness
Resonance	1.00	.51	.58	.66	.46	.33
Judgment	.46	1.00	.78	.94	.43	.60
Feeling	.48	.76	1.00	.84	.48	.48
Performance	.52	.86	.79	1.00	.38	.53
Imagery	.44	.58	.77	.65	1.00	.49
Awareness	.26	.55	.61	.62	.58	1.00

The top half of the diagonal shows correlation for the Giordano and the bottom half shows correlation for the Polo.
df=degree of freedom; Goodness of Fit Index (GFI); Comparative Fit Index (CFI);
Parsimony Normed Fit Index (PNFI): Root Mean Square of Approximation (RMSEA)

mended 0.9 level(CFI=0.988, TLI=0.981). The AIC for this model was 1,233.80. All factors loading were significant for both brands, and 16 standardized factor loadings exceeded 0.6. Thus, it can be concluded that our fashion brand equity scale exhibits configural invariance across the two brands.

Full metric invariance was tested by constraining the matrix of factor loadings to be invariant across the brand. There was a significant increase in chi-square between the model of configural and the

model of full metric invariance($\chi^2_{(10)} = 81.61$, $p<.001$), although the fit did not decrease substantially in terms of alternative fit indices. Thus, full metric invariance was not supported. Examination of the MIs (Modification Indices) revealed that the significance increase in chi-square was due to a lack of invariance of three items. It should be noted that the MI values might change in the model modification process.

To test for partial metric invariance, the constraints on these parameters were sequentially relaxed, starting with the loading that had the largest MI. The statistics for overall fit of the final model of partial metric invariance, after all three loadings were set free, are reported in the (Table 3). The increase in terms of chi-square was not significant($\chi^2_{(7)}=19.06$, $p>.05$), and the overall fit was acceptable(RMSEA=0.057, CFI=0.937, TLI=0.916). When the χ^2 fit difference between these models is insignificant, the factor structure is invariant across samples(Yoo and Donthu, 2001). Therefore, to satisfy the metric invariance, there is no significant χ^2 difference between the two models. Thus, partial metric invariance(with only three of 1 6 invariance constraints relaxed) was supported.

The next step was to impose scalar invariance on the model. However, given that only partial metric invariance was achieved, only the intercepts of the invariant factor loadings were constrained to be equal across brands. Full scalar invariance for this model was not supported(Table 3). The increase in term s of chi-square was significant($\chi^2_{(16)}=321.91$, $p<.001$). There was a significant difference between the configural and full scalar invariance models. The MIs indicated that the intercept for *Rel, Re3, Jd3, and Fe3* (MI = 28.05, 34.49, 15.98, 14.17) was not invariant across Polo and Giordano. Successively relaxing these four constraints yielded an improvement in fit as compared to the full scalar invariance model($\chi^2_{(12)} = 64.25$, $p<.001$). The increase in χ^2 relative to the partial metric invariance model(in which no constraints were imposed on the intercepts) wa s still significant($\chi^2_{(5)} = 45.19$, $p<.001$). The model fit improved when considering AIC, CFI, TLI. Thus, it can be concluded that the partial scalar invariance was not supported but configural and partial metric invariance measurement models were tenable.

3. Comparing means between two brands

Using the test of invariance model, configural, and partial scalar invariance was established, allowing the comparison of means between the Polo and Giordano brands. Sörbom(1974) showed that it is possible to make inferences about factor means, while analyzing data simultaneously from several samples. Using Sörboms approach, it was possible to assess differences in factor means among two or more populations. Using this approach, we fixed the means of Polo's six constructs; Resonance, Judgment, Feeling, Performance, Imagery, and Awareness. Then, we estimated the amount that Giordano's means values differed from those of Polo. This method also provided a test of significance for differences of factor means(Arbuckle and Worthke, 1999).

We were primarily interested in estimates of the six constructs' means; however, all estimates should be inspected to make sure that they are reasonable. The result yielded a good overall fit($\chi^2 = 1{,}041.02$, d.f. = 185, CFI = 0.987, RMSEA = 0.058, PNFI = 0.670, AIC = 1279.02). The result also showed ade-

Table 3. Comparison of Invariance Measurement Model

	χ^2 value	df	RMSEA	AIC	CFI	TLI
Configural invariance	969.80	172	0.058	1,233.80	0.988	0.981
Full metric invariance	1,051.41	182	0.059	1,231.41	0.933	0.911
Partial metric invariance	988.86	179	0.057	1,174.87	0.937	0.916
Full scalar invariance	1,291.71	188	0.065	1,523.71	0.983	0.976
Partial scalar invariance	1034.05	184	0.058	1,274.05	0.987	0.981

quate reliability estimates for the six values(α of 0.90~0.60) with all factor loadings significant(all t values exceed 3.2, $p<.001$). In order to compare the mean of structures, we fixed the mean of Polo 's constructs at zero.

For Giordano, there were significant differences at the 0.000 level except for the resonance construct (Table 4). We could interpret that Giordano's performance was estimated to be 0.884 units below Polo's performance. This difference was not affected by the initial decision to fix Polo's means at zero. If we had fixed Polo's means at 10.00, Giordano's means would have been estimated to be 9.116. If we had fixed Giordano's means at zero, Polo's means would have been estimated to be 0.884. The other values could be understood in the same manner.

Table 4. Giordanos Mean Differences of Constructs

	Estimate	S.E.	C.R.	P
Resonance	0.083	0.085	0.969	0.332
Performance	-0.884***	0.055	-15.935	0.000
Feeling	-1.368***	0.065	-21.171	0.000
Judgment	-0.504***	0.062	-8.154	0.000
Imagery	-0.718***	0.077	-9.292	0.000
Awareness	-0.790***	0.063	-12.590	0.000

***$p<.001$

V. Discussion

The measurement and management of brand equity have become top priority marketing issues in recent years, as evidenced by growing literature on the subject(Amber, 2001). In conclusion, academic research in branding has presented implications for marketers. The purpose of this research was to identify a psychometrically sound and generalizable measure of fashion brand equity by testing Kim and Lim's(2002) proposed scale. In particular, we attempted to determine the relative magnitude of brand equity by providing a measurement invariance test within the simultaneous confirmatory factor analysis of two brands' equity.

The result of this study improves the understanding of the dimensionality of fashion brand equity and provides a rigorous test for brand comparison. Therefore, this study has practical and theoretical implications that benefit brand equity research in several ways. First, fashion brand equity can be measured by Kim and Lim's(2002) scale comprised of 16 items reflecting six dimensions; customer-brand resonance, customer feeling, customer judgment, brand imagery, brand performance, and brand awareness. Second, we can support the measurement invariance of two brands' equities by meaningful comparison. In particular, configural and metric invariance are stringent and rigorous methods in test of invariance of structural equation model of fashion brand equity. Third, there are significant differences relative to the magnitude of five dimensions of brand equity. The greatest difference is in customer feeling, the smallest in customer judgment. This finding suggested that Polo's equity was estimated greater than Giordano's on every dimension except for customer-brand resonance. It implies that Giordano needs to develop a strategy for building strong brand equity focused on increasing customers' positive feelings. On the other hand, there is no significant difference in customer-brand resonance, which reflects the reason why Giordano consistently is a leading brand in the casual apparel market in Korea.

Capturing and synthesizing the complexity of brand equity provides tremendous challenges and opportunities that can improve brand management practices. By combining both the measurement and understanding of brand equity through one research technique, companies can evaluate a brand's long and short-term benefit. Several guidelines can be drawn from this study in terms of managerial recommendations. First, the proposed approach provides an indication of customers' source of brand equity. To manage customers' resources more competently, brand managers should understand how to build fashion brand equity from brand awareness to customer-brand resonance. Brand managers can integrate or segregate each dimension to measure their brand equity relative to their marketing strategy. For exam-

ple, if Giordano has a low value in terms of the brand awareness dimension, they should confirm the effectiveness of their advertising tactics. In addition, they may allocate the company's resources in order to establish an appropriate identity in the customers' awareness level. If a company is eager to amplify brand performance and the brand image in the customers' brand knowledge level, they should give attention to creating new products. Second, our measurement can capture the customers' emotional dimension. Therefore, more sophisticated and useful fashion brand strategies differentiating other generic goods can be established to elicit the right response of customers. Companies may find it beneficial to position their products based on feelings experienced during consumption.

This research inevitably has several limitations that present opportunities for further research. We recognize limitations relative to our data collection. Convenience sampling restricts the generalizability of our study. Our results may have differed if the population had included diverse ages as well as other demographic attributes. Furthermore, the causal relationships among six dimensions may have differed if different product categories and brands were compared. Also, an important issue is the interaction effect of dimensions on fashion brand equity. To check this possibility empirically, researchers should consider models based on brand experience, brand loyalty, and brand involvement.

References

Aaker, D. A. (1991). *Managing brand equity.* New York: Free Press.

Aaker, D. A. (1996). Measuring brand equity across products and markets. *California Management Review, 38*(3), 102–120.

Agarwar, M. K. & Rao, V. R. (1996). An empirical comparison of consumer-based measures of brand equity. *Marketing Letters, 7*(3), 237–247.

Amber, T. (1997). Do brands benefit consumer?. *International Journal of Advertising, 16*, 167–198.

Arbuckle, J. L. & Wothke, W. (1999). *Amos 4.0 users guide*. SmallWaters Coporation.

Bagozzi, R. P. & Baumgartner, H. (1994). The evaluation of structural equation models and hypothesis testing. in *Principle of Marketing Research*, ed. Richard P. Bagozzi, Cambridge, MA: Blackwell. 386–422.

Bearden, W. O., Netemyer, R. G. & Mobley, M. F. (1991). *Handbook of marketing scales: Multi items measures for marketing and consumer behavior research*, CA: Sage Publications.

Bharadwaj, S. G., Varadarajan, P. R. & Fahy, J. (1993). Sutainable competitive advantage in industries: a conceptual model and research propositions. *Journal of Marketing, 57*(October), 83–99.

Blackson, M. (2000). Observations: Building brand equity by managing the brand relationships. *Journal of Advertising Research, 40*(Nov./Dec.), 101–105.

Blakwell, R. D., Miniard, P. W. & Engel, J. F. (2001). *Consumer behavior* (9th ed.). Orlando: Harcourt College Publishers.

Bollen, K. A. (1989). *Structural equations with latent variables.* New York: Wiley.

Byren, B. M., Shavelson, R. J. & Muthén, B. (1989). Testing for the equivalence of the factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*(May), 456–466.

Choi, J. & Rhee, E. Y. (2001). The effect of price discount frequency on consumer evaluation of clothing brand equity. *The Korea Society of Clothing and Textile, 25*(6), 1025–1036.

Chaudhuri, A. & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty. *Journal of Marketing, 65*(April), 81–93.

Cobb-Walgren, C. J., Ruble, C. A. & Donthu, N. (1995). Brand equity, brand preference and purchase intent. *Journal of Advertising, 24*(3), 25–40.

Crimmins, J. C. (2000). Better measurement and management of brand value. *Journal of Advertising Research, 40*(6), 136–142.

Cudeck, R. (1989). Analysis of correlation matrices using covariance structure models. *Psychological Bulletin, 105*(March), 317–327.

Dyson, P., Farr, A. & Hollis, N. (1996). Understanding, measuring, and using brand equity. *Journal of Advertising, 25*(Nov/Dec), 9–21.

Erdem, T. & Swait, J. (1998). Brand equity as a signaling phenomenon. *Journal of Consumer Psychology, 7*(Nov), 131–157.

Faircloth, J. B., Capella, L. M. & Alford, B. L. (2001). The effect of brand attitude and brand image on brand equity. *Journal of Marketing: Theory and Practice, summer*, 61–75.

Farquhar, P. H. (1989). Managing brand equity. *Marketing Research, 1*(September), 24–33.

Gerbing, D. W. & Anderson, J. C. (1988). An updated

paradime for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research, 25*(May), 186–192.

Griffin, M., Babin, B. J. & Modianos, D. (2000). Shopping value of Russian consumer: The impact of habituation in a developing economy. *Journal of Retailing, 76*(1), 33–52.

Horn, J. L. & McArdle, J. J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research, 18*(Fall/Winter), 117–144.

Hoyer, W. (1984). An examination of consumer decision making for a common repeat purchase product. *Journal of consumer Research, 11*(December), 822–829.

Kamakura, W. A. & Russell, G. J. (1993). Measuring brand value with scanner data. *International Journal of Research in Marketing, 10*(March), 9–12.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(January), 1–22.

Kim, H. J. & Lim, S. J. (2002). How to measure customer based brand equity of casual wear. *The Korea Society of Clothing and Textile, 26*(11), 1660–1671.

Kim, K. W. & Rhee, E. Y. (1999). Clothing brand equity based on consumer evaluation. *The Korea Society of Clothing and Textile, 23*(8), 1075–1085.

Kirmani, A. & Zeithaml, V. A. (1993). *Advertising, perceived quality, and brand image*, in Aaker, D.A. and Biel, A.L.(Eds), *Brand equity and advertising: Advertisings role in building strong brands*, NJ; Lawrence Erlbaum Association.

Krishnan, H. S. (1996). Characteristics of memory association: A consumer-based brand equity perspective. *International Journal of Research in Marketing, 13*, 389–405.

Lane, V. & Jacobson, R. (1995). Stock market reactions to brand extension announcements: the effects of brand attitude and familiarity. *Journal of marketing, 59*(January), 63–77.

Lavidge, R. J. & Steiner, G. A. (1961). A Model for predictive measurement of advertising effectiveness. *Journal of Marketing, 25*(October), 59–62.

Leuthesser, L., Kohli, C. S. & Harich, K. R. (1995). Brand equity: the halo effect measure. *European Journal of Marketing, 29*(4), 57–66.

Mahajan, V., Rao, V. R. & Srivastava, R. K. (1994). An approach to assess the importance of brand equity in acquisition decisions. *Prod Innovation Manage, 11*, 221–235.

Maxham III, J. G. & Netemeyer, R. G. (2002). Modeling customer perceptions of complaint handling over time: The effects of perceived justice on satisfaction and intent. *Journal of Retailing, 78*, 239–252.

McGuire, W. J. (1972). Attitude change: the information processing paradigm. in c.g. mcclinitock (Ed.), *Experimental Social Psychology* (108–141). New York: Holt, Rinehart and Winston.

Meredith, W. (1993). Measurement invariance, factor analysis, and factorial invariance. *Psychometrika, 58* (December), 525–543.

Na, W. B., Marchall, R. & Keller, K. L. (1999). Measuring brand power: Validating a model for optimizing brand equity. *Journal of product and brand management, 8*(3), 170–184.

Park, C. S. & Srinivasan, V. (1994). A survey-based method for measuring and understanding brand equity and its extendibility. *Journal of Marketing Research, 31*(May), 271–288.

Rhee, J. U. (2000). The effect of country of origin and apparel brand equity on consumers' willingness to purchase apparel –comparison of Korean and U.S. consumers–. *The Korea Society of Clothing and Textile, 24*(5), 663–674.

Rock, D. A., Werts, C. E. & Flaugher, R. L. (1978). The use of analysis of covariance structures for comparing the psychometric properties of multiple variables across populations. *Multivariate Behavioral Research, 13*(Oct), 403–418.

Simon, C. J. & Sullivan, M. W. (1993). The measurement and determinants of brand equity: A financial approach. *Marketing Science, 12*, 28–52.

Sörbom, D. (1974). A general method for studying differences in factor means and factor structure between groups. *British Journal of Mathematical and Statistical Psychology, 27*, 229–239.

Srivastava, R. & Shocker, A. D. (1991). *Brand equity: a perspective on its meaning and measurement.* Working paper series, Cambridge, MA: Marketing Science Institute, 91–124.

Steenkamp, J. E. & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25*, 78–90.

Swait, J., Erdem, T., Louviere, J. & Dubelaar, C. (1993). The equalization price: a measure of consumer-perceived brand equity. *International Journal of Research Marketing, 10*(March), 23–45.

Yoo, B. H. & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research, 52*, 1–14.

Yoo, B. H., Donthu, N. & Lee, S. H. (2000). An examination of selected marketing mix elements and brand equity. *Journal of the Academy of Marketing Science, 28*(2), 195–211.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: a mean-end model and synthesis of evidence. *Journal of Marketing, 52*(July), 2–22.

요 약

치열한 경쟁구조하의 패션시장에서 강력한 브랜드자산은 기업 경쟁우위의 원천이 될 수 있다. 이는 브랜드 자산이 소비자가 브랜드에 가치를 부여하는 원천을 알게 함으로써 향후 브랜드 전략 수립의 중요한 지침을 제공하기 때문이다. 그러므로 브랜드 자산 관리에서의 핵심이란 곧 소비자 자산의 측정에 관한 부분일 것이다. 과거 20여 년간 마케팅 분야에서는 브랜드 자산 측정방법에 관한 많은 연구가 이루어져 왔다. 하지만 기존의 접근에서 다루어진 패션브랜드 자산의 측정들은 패션브랜드만의 다차원적인 사회심리적 특성을 반영하기에 미흡하였다. 이러한 관점에서 최근 김혜정과 임숙자(2002)는 Keller(2001)의 Customer Based Brand Equity Model을 기초로 하여 패션 브랜드 자산의 척도를 제안하였다. 그들은 패션브랜드 자산은 소비자 지각에서 위계적인 형성과정을 통해 형성되며 이러한 형성과정은 브랜드 종류에 따라 다소 상이하다는 것을 경험적으로 입증하였다. 그러나 각 브랜드 간의 자산 크기에 대한 상대적 비교는 유보되었는데, 이는 보다 엄격한 psychometric 검증을 결여 하였기 때문이다. 따라서 본 연구는 이의 후속 분석으로, 측정척도에 대한 확증적 요인분석(Confirmatory Factor Analysis)과 이의 측정모델(Measurement Model)에 대한 다모집단(Multi-Group)의 등치테스트(Invariance Test; 동일변량 가정)를 통해 경쟁관계의 두 브랜드에 대한 자산 크기의 상대적 차이를 비교하였다. 통계분석은 AMOA 4.0을 사용하여 구조방정식 모형분석을 하였다. 분석결과 패션브랜드 자산은 6개의 구성요소로 구성된 다차원의 개념이며 이들은 16개의 관찰변수를 통해 유의하게 측정될 수 있음을 검증하였다. 또한 '고객-브랜드 공명'차원을 제외한 5개의 구성요소(고객감정, 고객판단, 브랜드 이미지, 브랜드 성능, 브랜드 인식)의 평균값 비교에서 두 브랜드 간의 상대적 크기에 유의한 차이가 검증됨으로써 특정 브랜드의 자산이 고객에게는 보다 월등한 것으로 지각되고 있음을 확인하였다. 따라서 본 연구는 브랜드 간 자산 크기의 상대적 비교에 대한 통계적 타당성의 기초를 마련하였다는데 의의가 있다.