제품디자인에 대한 소비자의 심리적 반응이 브랜드 이미지와 브랜드 자산에 미치는 영향

The Effects of Consumers' Psychological Responses to Product Design on Brand Image and Brand Equity

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Abstract : Despite of the importance of design, relatively little research has been conducted on consumers' behavioral responses to product design and especially, the empirical studies which are related to consumers' psychological responses to product design. Understanding of the relationship between the response to product design and brand image or brand equity is limited. This research investigated the effect of the design image which can be formed by the response to product design on brand image and equity in two kinds of product types (utilitarian and symbolic product). The result shows that the product design image has a strong effect on the brand image in both products. Design image of the product influences brand equity in the symbolic product. However, there was no significant effect of the product design image on brand equity in the utilitarian product. In addition, the research found that brand image has a strong effect on brand equity in both products.

Keywords : design image, brand image, brand equity

요 약 : 디자인에 대한 중요성에도 불구하고 제품디자인에 대한 소비자의 행동적 반응과 관련된 연구는 상당히 부족한 실정이다. 특히 제품디자인에 대한 소비자의 심리적 반응에 대한 실증적 연구는 매우 부족하다. 따라서 제품디자인에 대한 반응과 브랜드 이미지나 브랜드 자산간의 관계에 대한 이해가 매우 제한적이라 할 수 있다. 본 연구는 제품 디자인에 대한 소비자의 심리적 반응을 통해 형성되는 디자인 이미지가 브랜드 이미지와 브랜드 자산에 어떠한 영향을 미치는지를 두 가지 제품 범주(효용제품과 상징제품)를 이용하여 검증하였다. 연구결과 두 가지 제품 범주 모두에서 제품 디자인 이미지는 브랜드 이미지에 긍정적인 영향을 미치는 것으로 나타났다. 또한 상징적 제품에서 디자인 이미지가 브랜드 자산에 영향을 미치는 것으로 나타났다. 그러나 효용 제품의 경우에는 제품 디자인 이미지가 브랜드 자산에 유의적인 영향을 미치지는

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못하는 것으로 나타났다. 또한 두 제품군 모두에서 브랜드 이미지는 브랜드 자산에 유의적인 영향을 미치는 것으로 나타났다.

주제어 : 디자인 이미지, 브랜드 이미지, 브랜드 자산

1. Introduction

Many researchers have attempted to find and explore the importance of design in marketing area(Block 1995; Bruce and Whitehead 1988). Block(1995) suggested four reasons which can explain why product design is important. First, product design can gain the attention of the consumers. Second, product design creates consumers' initial impression regarding other attributes. Third, product design could make human beings enjoy aesthetics with sensible and beautiful product design. Lastly, though numerous products are easily discarded, good design can prolong the period over which the consumer enjoys and wishes to own the product.

Therefore, it is crucial that marketers realize the potential of design to benefit their brand or business. Design can make a huge difference as products and services are getting more similar in terms of performance in the market, thus it can increase both sales and margins. In line with this increased awareness on the importance of product design, Buxton(2006) suggested that design must be regarded as an investment in the future and the one thing that is consistent could be design in an era of increasing fragmentation of communication. He also suggested that marketers recognize that apart from a good product, design is their main marketing weapon and it is the biggest single investment they will make for the future.

In this overall perspective, product design could be a critical tool for improving brand equity and it could improve the product image and brand equity. However, despite of the importance of design, relatively little research has been carried out on consumers' response to product design and especially, empirical studies which are related to consumers' psychological responses to product design and the relationship between the response to product design and brand image or brand equity. There is insufficient evidence on such aspects of consumers' behavior. Therefore, this research investigates the effect of the design image which can be formed by the response of the product design on brand image and equity.

2. Literature review

2.1 Design Image and Consumers' Psychological Responses to Product Design

2.1.1 The Definition of Design Image

In past research on image mentioned above, there are two common things which have to be considered in defining image. Firstly, most research defined image in two dimensions: 1) the imagery of an object and 2) beliefs, thought, and impression of an object. In cognitive psychology, knowledge is classified into two types, which are visual image

(imagery) and semantic meaning, and image is considered as visual representation in mind about a specific object. In exploring the definition of image, this research is limited to consideration of semantic meaning which can be expressed in the linguistic way to avoid the ambiguity of definition of image and increase the possibility of measuring it. Secondly, most research has considered image as the response, such as beliefs, impressions, and thoughts by the psychological process.

If image is defined as the result of a psychological process(e.g associations of ideas), design image could be defined as psychological responses to a product design. As Aaker(1991) defined brand image as everything which is associated with brand in mind, design image can be defined in terms of everything which is associated with design in mind. That is, design images of product design are the psychological responses such as beliefs, thoughts and impressions about design.

Therefore, design image is defined formally here as psychological responses such as beliefs and thoughts which can be expressed in the linguistic way about a product design. However, product's form represents a number of elements chosen and blended into a whole by the design team to achieve a particular sensory effect(Hollins and Pugh 1990). While not minimizing the importance of these other design elements, using the definition of Bloch, et al.(2003), the definition of product design in this paper is limited to visual product aesthetics or those characteristics that create a product's appearance, such as materials, proportion, colour, ornamentation, shape, size, and reflectivity. In conclusion, design image is defined here in terms of psychological responses such as beliefs and thoughts which

have semantic meanings about product aesthetics or those characteristics that create a product's appearance, such as materials, proportion, colour, ornamentation, shape, size and reflectivity.

2.1.2 Consumers' Psychological Responses to Product Design (Types of Design Image)

The product design may elicit a variety of perceptual responses from consumers. Bloch(1995) suggested that consumers' psychological responses to product design can be explained with two components which are cognitive and affective components. In his research, cognitive responses include both product-related beliefs and categorization. Firstly, the product form could create beliefs pertaining to such characteristics as durability, 'dollar value', technical sophistication, ease of use, gender role appropriateness, and prestige(Bloch 1995). Secondly, the concept of product categorization is another important type of cognitive response to product form(Loken and Ward 1990). According to categorization research, consumers try to understand a product by placing it within an existing category(Bloch 1995). Categorization can be shown to be based on the perceived similarity between a given product and some ideal representation of product categories and sub-categories(Shackleton and Sugiyama 1998).

The other psychological responses are affective responses. Perception of product form can lead to a simple positive or negative response such as liking and disliking, or they can evoke stronger aesthetic responses from consumers. These affective responses may be in response to the overall form or may relate to

individual design elements(Bloch 1995).

Recently, Na et al.(2008) using 3 product categories(mobile phone, toiletries, and MP3 player) have found that consumers' psychological responses have six distinct image dimensions(uniqueness, aesthetic, utility, femininity, noble, and compactness) and developed a 43 design image scale.

2.2 The Influences of Design Image on Brand Image and Brand Equity

Brand image is an overall meaning including a product attributes and its subjective associations. Keller(1993) divided product attributes into two categories: product-related and non-product-related attributes. Product-related attributes are defined as the ingredients necessary for the performance of the product or service function sought by consumers. Non-product-related attributes are defined as external aspects of the product or service that relate to its purchase or consumption and one of the main types of non-product-related attributes is packaging or product appearance information. According to this research, brand associations can arise as a result of perceptions about a product design. This leads to hypothesis 1:

H1: Design image has a positive effect on brand image.

In addition, according to the studies on architectural spaces and retail atmospherics(Bitner 1992), behavioral responses to design are divided into approach and avoidance. Approach behavior reflects the attraction for the design and means spending a lot of time in one place or undertaking research on the place. When consumers associate favourable things with the product design, approach behaviors increase. In addition, Bloch(1995) presented that when positive psychological response to a specific design takes place, consumers tend to make approach behaviors such as extended viewing, listening or touching of the product. Approach behavior is a part of aesthetic experiences and means the desire for a deeper exposure to the pleasing design of the product(Csikszentmihalyi and Robinson 1990). However, avoidance behavior means the results generated by the negative feelings for the product(Bitner 1992). When the product design causes negative belief or feeling, consumers keep themselves away from the product and the product is difficult for consumers to undertake a comprehensive search for or pursuit of.

To sum up, positive psychological responses which are caused by a good product design can enhance consumer loyalty and could in turn bring substantial returns to the firm. This leads to Hypothesis 2:

H2: Design image has a positive effect on brand equity.

2.3 The Influence of Brand Image on Brand Equity

According to established studies, the formation of positive brand image is considered to have a positive effect on brand equity(Aaker 1991). In addition, brand image is a very vital element for brand equity(Keller 1993). Krishnan(1996) argued that the brand with a high asset value has a more positive brand image than the brand with a low asset value. In addition, Lassar, et al.(1995) argued that premium prices and high brand values are closely related to the

brands with high image ratings.

In addition, Kapferer(1992) argued that brand image is a part of associative memory network playing a pivotal role of consumers' decision making, has a potential effect on brand evocation or brand evaluation, and finally contributes to brand equity. In other words, brand association created through the company's marketing mix activities and the product use by consumers contributes to defining brand image by consumers(Keller 1993). The special, strong and favourable association creates a positive brand image and this brand image induces the consumers' biased brand activities to enhancing brand equity(Keller 1993). Further, the special, strong and favourable image makes possible the positioning of strategically differentiated brand meaning into the consumers' minds, which contributes to enhancing brand equity (Pitta and Katsanis 1995). This leads to Hypothesis 3:

H3: Brand image has a positive effect on brand equity.

3. Empirical Study

3.1 Method

3.1.1 Stimuli

According to past research, a product can be categorized as symbolic or utilitarian. To test the study model, two products which are symbolic and utilitarian product were selected. One hundred participants were asked to rate each of eleven products, which were selected from the Batra and Ahtola's study(1991), on a seven-point disagree/agree items. These measured the degree to which the product was functional and could be used for self-expressive purposes. The results show that mobile phone and cosmetic are both utilitarian and symbolic. However, the computer, toothpaste, MP3, automobile, pain reliever and beverage were perceived as the utilitarian product and jeans and toiletries were perceived as symbolic products. MP3 and toiletries were selected in the utilitarian and symbolic product category. Three criteria guided the selection of products: firstly, it should be a currently important, well-known product group; secondly, it should be offered in various colours and shapes across the various products in that market and thirdly, it should be a product group in which consumers consider design an important criterion when they make a purchase decision. Mp3 player and toiletries were selected as stimuli because these products matched with these criteria.

In order to select brands of MP3 player and toiletries, 100 respondents(male 59%, mean age = 24.4) was asked to write down a brand which they can associate with two products(MP3 player and Toiletries). The top 3 brands which were associated with MP3 player product were Iriver(42%), Samsung(20%), and Apple (18%). In addition, Chanel(32%), Calvin Klein(15%), and Polo(11%) were the top 3 brands in toiletries product. Therefore, these brands were used as stimuli. After selection of brands, 3 product designs were selected in each brand. To block the effect of brand on the evaluation of product design and avoid the evaluation with the inference through brands which were given to respondents, brand names and symbols were removed from the slides which were shown to respondents. In addition, designs that have not yet been launched in the

market were selected and used in each brand. Respondents have not been exposed to these designs, thus they could not associate the brand with design which were given to them.

3.1.2 Subject and Procedure

360 undergraduate students were selected using convenient sampling method for this study. 56.1% of the respondents were male and 43.9% were female and the mean age was 22.22(S.D.=2.27) in MP3 player group. In toiletries product group, 41.7% of the respondents were male and 58.3% were female and the mean age was 22.50(S.D.=1.88). Subjects were all undergraduate students studying a wide range of subjects. It was felt that this represented an appropriate purposive sample group as they represent a demographic very familiar with experimental stimuli and are likely to be influenced by design attributes when they compare products or make a purchase decision. They were randomly assigned to one of the six different product designs(three designs of each product) which were selected from the primary test.

3.1.3 Measures

All of the scales necessary to measure the constructs in the proposed conceptual model— brand image, design image, design equity, brand equity—were taken directly from existing literature as follows:

1) Brand Image: According to Roth(1995), brand image can be manipulated as a firm's self reported brand image— functional, social or sensory. The functional brand image was measured on

a seven-point scale(1=a little, 7=a lot) according to the degree to which (1) a brand has the image that the brand solves the problems which I have, (2) a brand has the image that the solves the problems which can be happen in the future or (3) a brand has the image that the brand provides functional benefits. The social brand image was measured on a seven-point scale(1=a little, 7=a lot) according to the degree to which (1) a brand has the image that the brand can convey my status to other people, (2) a brand has the image that the brand gets social approval or (3) a brand has the image that the brand gets accreditation from other people. Finally, the sensory brand image was measured on a seven-point scale(1=a little, 7=a lot) according to the degree to which (1) a brand has the image that the brand provides variety, (2) a brand has the image that the brand provides stimulation or (3) a brand has the image that the brand provides sensory gratification.

2) Design Image: The design image scale used in this study was the scale which was developed by Na et. al.(2008). They developed 6 dimensions(aesthetics, uniqueness, femininity, noble, utility, and compactness) of design image which have 43 design image scales. Using the scales, respondents were asked to rate the extent to which the 43 words describe design image using a seven-point Likert scale(1=not at all descriptive, 7=extremely descriptive).

3) Brand Equity: To measure the multidimensional properties of brand equity, two measures were used in this study: purchase intention(MacKenzie, et al. 1986)

and willingness to pay(Park and Srinivasan 1994).

3.2 Preliminary Analysis

3.2.1 The Homogeneity Test

To combine three kinds of data together, the homogeneity of three groups was tested in several ways. The researchers tested whether there were no difference among groups in product knowledge(Park, et al. 1994) and involvement(Zaichkowsky 1985) of MP3 player and toiletries. All the Cronbach's alpha values of these variables were more than 0.8(MP3 player: Knowledge .872, Involvement .805; Toiletries: Knowledge .919, Involvement .943), and the result indicates that the measured items are reliable(Nunnally 1967). In order to test the homogeneity among groups, an ANOVA using the product knowledge and involvement measures was run. The results show that there was no difference among groups in product knowledge and involvement in MP3 player($F=.065$, $p>.10$ and $F=.655$, $p>.10$ respectively) and toiletries($F=.925$, $p>.10$ and $F=.947$, $p>.10$ respectively). Therefore, the homogeneity among three groups was confirmed and there was no significant difference among the three groups. With these results, three kinds of data were combined into a data set in each product category.

3.2.2 Manipulation Check

A validity test is needed to confirm that the experiment stimuli(toiletries and MP3 player) are well identified with utilitarian and symbolic product respectively. The T-test was run to verify the difference of the mean values of functional and symbolic value. The results show that the means of utilitarian value are 5.7(MP3 player) and 3.3(toiletries) and the means of symbolic value were 3.1(MP3 player) and 5.4(toiletries). There was significant difference in functional and symbolic value between two products($p<.05$). Therefore, it is verified that the MP3 product has utilitarian attributes and the toiletries product has symbolic attributes.

3.3 Test the Dimensions of Design Image and Brand Image

3.3.1 Convergent Validity Test through CFA

With CFA using a covariance matrix, this research analyzes the appropriateness the model. Tables 1 and 2 summarize the results. In case of the big, complex model with high degree of freedom, a conservative evaluation is highly recommended by more stable values like the normed fit index(NFI) and comparative fit index(CFI)(Bagozzi and Yi 1988).

For the convergent validity test for the brand image measure, the chi-square residual resulting from the analysis of MP3 players was found to be 95.05(d.f.=24, $p<.01$), yielding NFI and CFI of .95 and .96 respectively. In case of the toiletries product group, chi-square is 38.57(d.f.=24, $p<.01$) and NFI and CFI are .97 and .98 respectively. These statistics indicate a reasonable fit to the data(Carmines and McIver 1981) in both products.

Table 1. Confirmatory factor analysis results (Brand Image)

Latent construct	Item	MP3	Toiletries
Functional Image	solve current problems solve future problems provide functional benefits	.877 .919 .776	.904 .935 .701
	Cronbach's	.884	.881
Social Image	convey my status get social approval get accreditation	.732 .911 .928	.847 .983 .821
	Cronbach's	.888	.908
Sensory Image	provide variety provide stimulation provide sensory gratification	.698 .847 .729	.743 .917 .831
	Cronbach's	.791	.866
Fit Indices		$\chi^2 = 82.68$ (d.f.= 24, p<.01) NFI=0.96, CFI=0.97	$\chi^2 = 38.75$ (d.f.= 24, p<.01) NFI=0.97, CFI=0.98

In addition, the t-value for each loading estimate is significant($p<.01$). Each loading estimate exhibits a high level of significance($p<0.01$), and each scale displays acceptable reliability(see table 2). Also the results of the test of CFA of brand image measure show that chi-square is 2766.12(d.f.=845, p<.01) and NFI and CFI are .95 each in MP3 product group and chi-square is 2128.72(d.f.=845, p<.01) and NFI and CFI are .93 and .96 respectively in toiletries product group. The results provide additional evidence of the scale's convergent validity(Anderson and Gerbing 1988).

Cronbach's alpha was used to assess reliability of each dimension of design image and brand image. All the Cronbach's alpha values of these variables were more than 0.8, and the result indicates that the measured items are reliable(see table 1 and 2, Nunnally 1967).

All items of each dimension were averaged and used as six design images and three brand images index.

Table 2. Confirmatory factor analysis results (Design Image)

Latent construct	Item	MP3 Player	Toiletries
Aesthetics	polished stylish fabulous luxurious cool dignified tasteful well-balanced modernistic Charming fascinating urbanized sensual	.743 .794 .800 .835 .484 .794 .883 .837 .725 .803 .786 .618 .741	.821 .826 .841 .829 .553 .860 .906 .801 .726 .846 .833 .574 .797
	Cronbach's	.946	.955
Uniqueness	fresh exclusive contrasting exceptional uncommon rare different unfamiliar innovative Infrequent sensational	.677 .722 .728 .718 .774 .810 .680 .745 .841 .901 .632	.775 .828 .837 .880 .753 .761 .753 .638 .817 .793 .683
	Cronbach's	.933	.935
Femininity	amiable perky adorable emotional tiny neat	.685 .748 .824 .741 .741 .584	.779 .818 .821 .846 .792 .678
	Cronbach's	.864	.822
Noble	westernized sophisticated noble elegant delicate	.661 .735 .888 .739 .746	.778 .769 .908 .812 .787
	Cronbach's	.863	.871
Utility	handy practical useful applicable	.642 .748 .746 .829	.765 .790 .711 .862
	Cronbach's	.825	.842
Compactness	stable simple untangle uncomplicated	.558 .702 .692 .610	.766 .833 .670 .564
	Cronbach's	.723	.692
Fit Indices		χ^2=2339.18 (d.f.=845, p<.01) NFI=0.94 CFI=0.94	χ^2=2128.72 (d.f.=845, p<.01) NFI=0.93 CFI=0.96

3.4 Assessing the Measurement Model

3.4.1 Factor Analysis

A factor analysis has been performed to confirm that all of the measured items are individually grouped according to the research model dimension. As Table 3 and 4 show that factors are divided into 3 dimensions such as design image, brand image, design equity, and brand equity same as the research model. The accumulated variance explained by the 3 factors were 75.452% and 73.114% respectively in both product categories.

Table 3. Results of Factor Analysis(MP3 Player)

Items	Design Image	Brand Image	Brand Equity
Noble	.901	.001	.188
Aesthetics	.888	.009	.156
Uniqueness	.875	.068	.089
Femininity	.861	.125	.058
Utility	.858	.264	.027
Compactness	.759	.110	.247
Symbolic image	.138	.824	.229
Utilitarian Image	.148	.777	.351
Experiential Image	.190	.745	.051
Purchase Intention	.085	.058	.869
Pay a Premium	.247	.400	.543
Variance explained	34.878	25.753	14.821
Eigenvalue	4.481	2.483	1.336
Cronbach's alpha	.764	.864	.964

Table 4. Results of Factor Analysis (Toiletries)

Items	Design Image	Brand Image	Brand Equity
Aesthetics	.903	.135	.214
Noble	.898	.058	.154
Uniqueness	.880	.116	.086
Femininity	.875	.137	.154
Utility	.874	.016	.016
Compactness	.848	.041	.008
Symbolic image	.289	.722	.115
Utilitarian Image	.155	.671	.101
Experiential Image	.033	.671	.320
Purchase Intention	.029	.007	.917
Pay a Premium	.233	.125	.800
Variance explained	37.537	21.377	14.200
Eigenvalue	4.129	2.351	1.562
Cronbach's alpha	.813	.724	.927

3.4.2 The Reliability Test

All the Cronbach's alpha values of these variables were more than 0.7 in both product groups, and the result indicates that the measured items are reliable(see table 3 and table 4)

3.4.3 Discriminant Validity Test

Construct validity requires that discriminant validity be achieved. Discriminant validity is achieved when the phi correlations between the constructs are less than one. Since all phis are less than one in both product groups, discriminant validity is supported in both product groups. Another method suggested by Anderson and Gerbing(1988) is to examine the confidence interval around each phi correlation(phi correlation plus or minus 2

standard errors). If the confidence interval does not include the value one, then discriminant validity is supported. Since none of the confidence intervals of phi correlation include the value one, discriminant validity is supported(see table 5 and 6).

Table 5. PHI Matrix (MP3 Player)

	Design Image	Brand Equity	Brand Image
Design Image	1.000		
Brand Equity	.207 (.077)	1.000	
Brand Image	.299 (.077)	.831 (.030)	1.000

Table 6. PHI Matrix (Toiletries)

	Design Image	Brand Equity	Brand Image
Design Image	1.000		
Brand Equity	.175 (.077)	1.000	
Brand Image	.403 (.076)	.714 (.052)	1.000

3.4.4 The Parameter Estimates between the Latent Construct and Its Observed Variables

To assess the measurement model, the parameter estimates(loadings or λS) between the latent construct and its observed variables were measured. All variables(see Table 7 and 8) had t-values greater than +/-1.96 at a .05 level of significance, suggesting that the variables and latent constructs are closely related in both product groups.

Table 7. The parameter estimates between the latent and observed variables(MP3 Player)

Construct	Estimate	t-value	P-value
Design Image($\xi 1$):			
$\lambda 11$	1.06	14.95	<.01
$\lambda 21$	.62	7.37	<.01
$\lambda 31$	.71	8.94	<.01
$\lambda 41$	.94	12.98	<.01
$\lambda 51$	.55	7.49	<.01
$\lambda 61$	.18	2.14	<.01
Brand Equity($\eta 1$):			
$\lambda 11$	1.46	24.25	<.01
$\lambda 21$	1.57	16.77	<.01
Brand Image($\eta 2$):			
$\lambda 12$	1.21	14.05	<.01
$\lambda 22$	1.27	14.61	<.01
$\lambda 32$	.96	11.51	<.01

Table 8. The parameter estimates between the latent and observed variables(Toiletries)

Construct	Estimate	t-value	P-value
Design Image($\xi 1$):			
$\lambda 11$	1.20	16.88	<.01
$\lambda 21$	.77	11.70	<.01
$\lambda 31$	1.04	13.13	<.01
$\lambda 41$	1.12	13.87	<.01
$\lambda 51$	.39	4.59	<.01
$\lambda 61$	.16	1.99	<.01
Brand Equity($\eta 1$):			
$\lambda 11$	1.54	19.30	<.01
$\lambda 21$	1.36	17.39	<.01
Brand Image($\eta 2$):			
$\lambda 12$	.85	7.22	<.01
$\lambda 22$	.75	6.72	<.01
$\lambda 32$	1.08	8.28	<.01

3.4.5 Testing Hypotheses

Hypotheses 1 through 3 are tested using the structural equation model with an examination of the structural coefficients. The structural model results are summarized in Table 9.

Table 9. Results of the structural model

Path	MP3		Toiletries	
	Coefficient	P value	Coefficient	P value
H1	.29(3.56)	P<.01	.40(4.39)	P<.01
H2	n.s.	P>.10	.14(1.83)	P<.10
H3	.84(12.19)	P<.01	.77(7.18)	P<.01

Note: n.s.; non-significant, ( ); t-value

This model appears to have achieved a satisfactory level of nomological validity. The coefficients(see Table 9) are significant(except the path between design image and brand equity in MP3 group) and generally support the theory represented in the model. Predictive validity for the model is supported because the parameter estimates are a priori significant and in the magnitudes expected(except one path).

The LISREL output furnishes a number of measures which allow assessment of the absolute and incremental fit of the proposed model. In the model a chi-square of 101.47(df=39, p<.01) and 84.12(df=39, p<.01) were observed in MP3 and toiletries group respectively. Goodness of fit(GFI) indices .91(MP3) and .92(Toiletries) were calculated. Values greater than .90 are normally accepted as evidence of acceptable model fit(Bargozzi and Yi 1988). A Root Mean Square Residual(RMR) value of less than .08 is offered by Hu and Bentler(1999) as evidence of acceptable overall model fit. RMR of .11 and .058 were observed for the MP3 player and

toiletries group respectively. The model of MP3 group is somewhat outside of the acceptance range. Incremental fit measures close to .95 for NFI(Normed Fit Index) and CFI(Comparative Fit Index) are cited as indication of acceptable fit(Hu and Bentler 1999). NFI indices .94 were calculated in both groups and CFI indices .96(MP3 player) and .97(Toiletries) were observed respectively, suggesting an acceptable fit. Based on this evidence it seems reasonable to conclude that the model has achieved an acceptable goodness of fit in both the MP3 and toiletries groups.

The Effect of Design Image on Brand Image (H1): It was proposed that brand attitude would have a positive direct effect on brand equity in H1. This relationship has a parameter estimate of .40 and a t-value of 4.39(p<.01) in toiletries product group. In addition, the positive influence of design image on brand image is significant at the .01 in MP3 player group(t-value 3.56, p<.01). Therefore, there was a significant effect between design image and brand image and H1 is supported.

The effect of Design Image on Brand Equity (H2): It was proposed that design image would have a significant positive effect on brand equity. This relationship has a parameter estimate of .14 and a t-value of 1.83(p<.10) which indicates the marginal influence of design image on brand equity in toiletries product group. However, the positive influence of design image on brand image is not significant at the .10 in MP3 player product group. Thus, H2 is partially supported.

The Effect of Brand Image on Brand Equity (H3): It is proposed that brand image would have a significant positive effect on brand equity in H1. The measured coefficient is .84 and .77 respectively in both product categories,

(p<.01), strongly suggesting the positive influence of brand image on brand equity. Thus, H3 is supported.

Comparison the effect of design image on brand equity between utilitarian and symbolic product: The results show that the effects of design image on brand equity are different between two product groups. In utilitarian product(MP3 player), design image has a strong effect on brand image but does not have a significant effect on brand equity. On the other hand, design image has effects on brand image and brand equity in the symbolic product(toiletries). In other words, design image directly influences brand image and brand equity in symbolic product. Design image, however, has an indirect effect on brand equity through brand image in the utilitarian product.

Toiletries

MP3 player

Figure 1. Summarizes the results of analysis.

4. Discussion

The research investigated the effect of design image which is formed by consumers' responses toward product design on brand image and equity in utilitarian and symbolic products.

This paper contributes to the branding literature because its focus is not a macro level examination of the aggregate equity outcome or even the broadly measured contributors to brand equity, but is a demonstration that brand equity can be manipulated at the independent construct level by providing specific design image or signals to consumers and that these images will result in brand images that influence brand equity. An empirical foundation is provided for effective management of design image and brand image to build up strong brand equity.

The results support the hypothesis that brand image influence brand equity in both products and provide support for the view of the past research which is related to the relationship between brand image and brand equity(i.e. Keller 1993).

The results also support the hypothesis that design image has a strong effect on brand image in both products. Although design image influences brand equity in the symbolic product, there was no significant effect of design image on brand equity in the utilitarian product. In addition, the research found that brand image has a strong effect on brand equity which is consistent with past research(Aaker 1991; Kapferer 1992; Keller 1993). The interesting finding is that there were different effects of design image on brand equity between utilitarian and symbolic product. Design image
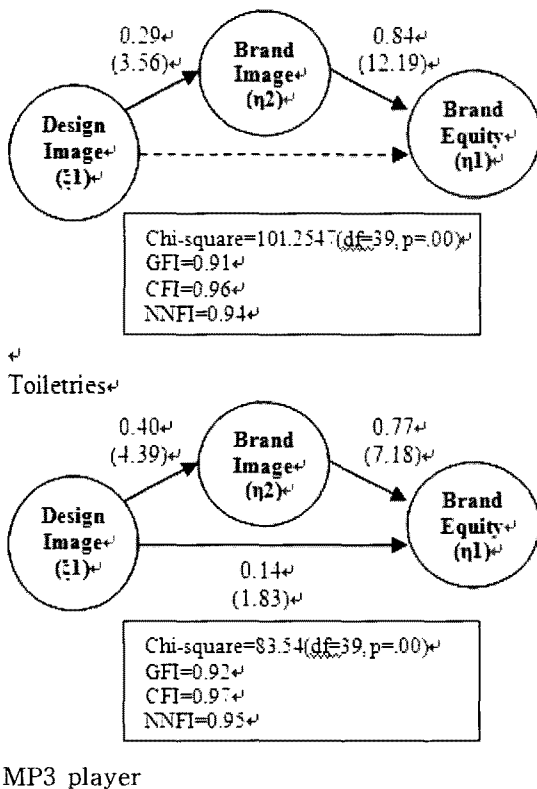
has a direct effect on brand equity in the symbolic product, and an indirect effect on brand equity through brand image in the utilitarian product.

The following discussion provides guidance for marketing managers trying to create consumer-based brand equity. Firstly, marketers can create and grow brand equity by managing the design image constructs. Particularly in relation to symbolic products, the research suggested that creation of different brand images through design image significantly affected the brand equity measures of purchase intentions and willingness to pay premium prices.

Secondly, the research found that design image which is formed by consumers' responses toward the product design influence brand image. Therefore, marketers should consider design image as an important tool for creating positive brand image in their markets.

Thirdly, companies which are launching symbolic products in their market should invest marketing activities on making positive design image in the same way as they invest in building on brand image.

5. Research Limitations and Future Research

This research indicates a set of findings with implications for practitioners. However, it also has limitations that suggest areas for further research.

Firstly, this research investigated the overall effects of design images on brand image and brand equity. However, six design images which were used in this research could have different effects on three types of brand images. For example, aesthetic design image can influence symbolic brand image more than utilitarian brand image. Thus, different effects of design images on brand images and brand equity should be examined for finding more meaning implications.

Secondly, although this research found the different effect of design image on brand equity, effects of design image on brand image and brand equity were not compared according to product types. In other words, the strength of the design image effect on brand image and brand equity could differ by type of products. Design image could influence brand image and brand equity more in product categories in which consumers pay more attention to design attributes in their product evaluation process than in the product categories where they consider the functional attributes as the important criteria to evaluate products. Therefore, future research should compare the strength of design image effect on brand image and brand equity according to product types.

Lastly, while the use of students was appropriate for this study involving MP3 player and toiletries, any generalization to the entire population should be avoided. Future research should be conducted with a sample more representative of the entire consuming population.

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