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경영학석사학위논문

The Relative Effect of Subjective and Objective Fit on Brand Extension Success

주관적 브랜드 적합성과 객관적 브랜드적합성이 브랜드 확장에 미치는 상대적 영향에 대한 연구

2014 년 2 월

서울대학교 대학원

경영학과 경영학 전공

남예지

The Relative Effect of Subjective and Objective Fit on Brand Extension Success

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이 논문을 경영석사학위논문으로 제출함

2014 년 2 월

서울대학교 대학원

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Abstract

This paper focuses on the relative importance of subjective and objective fit on brand extension success. Brand fit refers to consumer perceptions on the degree of similarity or correspondence between a parent brand and the extended brand. To evaluate brand fit, consumers often use both objective and subjective measures. A subjective fit measures the similarity in brand image; an objective fit measures the similarity of the category of the brand.

This paper details the relative importance of each of the fit criteria in brand success. Specifically, it examines their importance when risks (social, financial and performance) are associated with a purchase. It also examines their importance when consumer knowledge- both familiarity and expertise- of the parent brand and of the extended category and the expertise is also related to confidence.

I use survey methods to collect data on subjective and objective fits, consumer risks, knowledge, and confidence on category as well as the parent brand, and purchase intention for various number of brand extensions. I then model it using nonparametric Multivariate Adaptive Regression Splines model (Friendman, 1991). I estimate three models: 1) the covariates' (including a category and a brand-specific dummy variable) impact on purchase intention, 2) asimultaneous equation model of subjective fit, objective fit, and purchase intention and 3) the covariates' impact on purchase intention (interaction allowed only for brand fit variables). Then simulation methods are used to find

the relative purchase intention through two types of brand fit for any single variable while controlling for effects of other variables. Next, the bootstrapping method is used to test whether the influence of subjective and objective fit are equal for each variable. With the result from bootstrap, a simulation method is used once again to find the relative purchase intention through two types of brand fit when two variables are considered at the same time while controlling for effects from other variables.

From our simultaneous equations model, I find that consumers weigh objective fit more heavily than subjective fit. When any single variable is considered for finding purchase intention, objective fit has a greater influence at low perception levels and subjective fit has a greater influence at high perception levels, regardless of variable type. The hypothesis -that the influence of subjective and objective fit is equal- is supported for three variables: extended category confidence, social risk, and parent brand expertise (i.e., these variables had similar purchase intention influence through subjective and objective fits). Relative purchase intention through subjective and objective fit, in a combination of two of three variables, are overlooked.

Keywords: Brand Extension, Brand Fit, Multivariate Adaptive Regression Splines model, Risk, Confidence, Knowledge

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1. Introduction

Whenever a company has a new product that it wants to introduce to the market so it can extend its brand, it faces a threefold challenge—keep the cost of the introduction relatively low, make it succeed, and ensure its growth. Finding ways to do this is the job of brand marketers. One way of reducing the risk of failure is to introduce the product under the aegis of an established brand name. Such a method of putting out a new product is known as a brand extension and it is much less costly than building a new brand. Indeed, approximately 80 to 90 percent of new products in any given year are brand extensions (Keller, 2008). A typical brand extension applies a parent brand name to a new product in a category that is either a high category fit or a low one, and in so doing exploits the value of the well-established brand equity of the parent brand name.

Brand extensions can be either horizontal or vertical. Horizontal brand extension applies an existing brand name to a new product produced either in a related product category (i.e., high category fit) or in a product category entirely new to the firm (i.e., low category fit). Vertical brand extension introduces a brand extension in the same product category (i.e., high category fit) as the parent brand, but at a different price point or quality level. A second brand, in vertical brand extension, is usually introduced close to the core brand to display the link between the parent and the extended brand (Kim & Lavack, 1996) because parent brand familiarity assists new product introduction in the market.

Whether it is a vertical or horizontal brand extension, an important factor for brand extension success is the fit between the parent and the extended brand. Researchers who have studied moderators of brand extension success or failure have looked at a wide variety of moderators: brand strength, symbolic value, order of entry, firm size, firm's marketing competency (Reddy et al., 1994), fit between the parent brand and the extension product, marketing support, parent-brand confidence, and retailer acceptance (Völckner and Sattler, 2006). What they have found to wield a substantial effect on a brand's success are the following items: inherent popularity of the extension category, fit between the parent brand and the extension product, marketing support, parent-brand confidence and retailer acceptance. Because of its importance to the success of a brand extension, fit has emerged as a critically important research topic, Nevertheless, there has been limited study on the relative importance of subjective and objective fit.

Adweek has reported the 10 best and worst brand extensions. It considered the best to be Nestlé Crunch Girl Scout Cookie Candy Bars and the worst to be Zippo the women's perfume. In terms of categories (i.e., the objective fit), Nestlé is clearly a better fit with Girl Scout Cookies than Zippo is with perfume. However, Zippo's subjective fit—its product design or image is not at all distant from that of the zippo perfume. So which is more important—the subjective or objective fit? This question touches on what I seek to answer in this paper: What is more important to the success of a brand extension: subjective fit, objective fit, or are they equally important? A brand extension is most likely to succeed under what conditions?

While many studies have researched the importance of the fit, prior brand extension fit research has not distinguished between subjective and objective fits. I seek to fill this gap by studying the relative importance of subjective and objective fit criteria on consumer preferences. This paper also contributes by reviewing numerous studies on brand extension as well as proposing a concrete scale to measure both subjective and objective fits. Moreover, I discern the conditions for the relative importance of subjective and objective fit for brand extension success.

The rest of this paper is organized as follows. In Section 2, I review previous studies on brand extension success, brand fit, and how familiarity, expertise and confidence are important variables related to brand extension success. Section 3 explains how I used surveying methods to collect data on subjective fit, objective fit, brand and category knowledge, confidence and consumer choice (or preferences) for various numbers of brand extensions; the section then goes over the pretest and main test. In Section 4, I propose using multivariate adaptive regression splines (MARS) model and how this model suits the purpose of the study; the section then discusses the results after running the MARS model. In Section 5, I discuss simulation results and bootstrapping results to find the error bands of the difference in intention generated through subjective fit and objective fit. Section 6 ends the paper with a discussion of the implications and suggestions for future research.

2. Literature Review

2.1 Brand Fit

The related literature to this study has mainly researched advertising, consumer knowledge, associations, consistency, risk, regret, overconfidence, and brand image in relation to brand fit. Volckner and Sattler (2006) empirically displayed mediating and moderating factors between a broad set of variables of brand extension success. They found that the fit between the parent brand and the extended product is significant, and it is the most important driver on extension success. As consumers perceive greater fit, the greater the degree in which consumers view the preference of the extending brand to carry over to its new product category (Barta et al., 2010). The area with the greatest number of studies in association to brand fit is advertising, particularly exposure of the brand name through advertising (Bridges et al., 2000), priming (Nakamoto 1990; Bettman & Sugan, 1987; Zhang & Sood, 2002; Yeung & Wyer, 2005; Bambauer-Sachse, Huttl, and Gierl, 2011; Klink & Smith, 2001), and distancing (Kim, Lavack, & Smith, 2001). Particularly, Bambauer-Sachse, Huttl, & Gierl (2011) showed that advertisement elements linked with the parent brand could build an association between the parent and the extended brand and thus strengthen the perceived fit. Similarly, increased exposure of brand could help aid information retrieval processes resulting in improved fit perceptions (Klink & Smith, 2001) and also attenuate incongruent extensions (Lane, 2010).

Table 1. Brand Fit Research Topics

Topic	Relevant Literature
Conceptualization and empirical evidence on the two dimensions of the fit construct	Bhat & Reddy, 1997, 2001; Bridges, Keller, & Sood, 2000; Park, Milberg, & Lawson, 1991; Swaminathan, Fox & Reddy, 2001
Brand advertising can improve fit perceptions:	
Exposure	Klink & Smith, 2001 ;Lane, 2000
Priming	Bambauer-Sachse, Huttl, & Gierl, 2011; Boush, 1993; Chakravarti, Pryor & Brodie, 1998; Zhang & Sood, 2002
Distancing	Kim, Lavack, & Smith, 2001
Consumer knowledge and Experience with past extension	Aaker & Keller, 1992; Boush & Loekn, 1994; Czeller, 2003;
Associations	Broniarczyk &Alba, 1994; Bhat & Reddy, 2001; Bridges, Keller & Sood, 2000; Chakravarti, MacInnis & Nakamoto, 1990; Czeller, 2003; Park, Milberg & d Lawson, 1991
Consistency (congruency)	
of personality dimension	Lau & Phau, 2007
of brand concept	Park, Milberg & Lawson, 1991
of common usage or goal	Martin & Stewart, 2001; Park, Milberg & Lawson, 1991
Risk	DelVecchio & Smith, 2005; Campbell & Goodstein, 2001; Milberg, Sinn & Goodstein, 2010
Brand Image	Aaker & Keller 1992; Bhat & Reddy, 2001; Salinas & Perez, 2008

Park, Milberg and Lawson (1991) distinguished two types of similarity conceptions that affect the perception for brand extension. The first type is product feature similarity perception which identifies concrete (feature correlations, attribute matching, etc.) or abstract (shared-usage situations, etc.) features between the parent and the extended brand. Concept consistency perceptions rely on the extended product's ability to grasp the brand concept (Park Milberg & Lawson,1991). Bhat & Reddy (2001) viewed the extension fit as being two dimensions of product category fit and brand image fit. Product category fit is defined as consumers' perceptions of the similarity of the product categories of the parent and the extended brand. Brand image fit refers to consumers' perceptions of the similarity between image of extended brand and the parent brand. Lastly, Mao and Krishnan (2006) claimed that brand extension fits can be perceived by calibrating brand prototype or product exemplar. Prototype fit is defined as the level of fit between an extended brand and the general imagery of the parent brand. Exemplar fit is defined as the level of fit of the extended brand's existing product of with the parent brand.

Park, Milberg, and Lawson (1991), Mao and Krishnan(2006), and Bhat and Reddy (2001) all saw the need to differentiate multiple dimensions of extension fit. They were not, however, able to agree on a conclusive definition. Therefore, this study attempts to clear up the confusion while putting forward definitions of objective and subjective fits. My definitions of subjective and objective fit most closely follow those of Bhat and Reddy (2001). I define objective fit as the consumers' perceptions of the similarity of the product categories of the

parent and extended brand; subjective fit refers to the consumers' perceptions of the similarity between the image of the extended brand and the parent brand.

Because of its importance to the success of brand extension, fit has emerged as a critically important research topic. Nonetheless, research is limited on the relevant importance of subjective and objective fit. Starbucks, the coffeehouse chain based in Seattle, Washington, is expanding their brand by introducing to some of their stores food such as sandwich and lasagna. Food and coffee may belong to similar categories, enjoying a high objective fit. However, ready-to-go instant food may clash with Starbucks' premium image in consumer's mind, potentially creating a low subjective fit. Sometimes an extended brand can be similar in both subjective and objective fit while other brands, such as Starbucks in this case, have a similar objective fit but a dissimilar subjective fit. The relative importance of these two fits is still unknown. Therefore, I seek to find which particular criteria of the fit, subjective or objective, has a greater impact on consumer decisions when choosing a brand-extended product.

2.2 Risk

When purchasing a product there are risks involved; the product might not work properly; the product could turn out to be something different than the consumer expected; the purchase could cast an unflattering light on the consumer social status, and/or performance of the product might turn out to be disappointing given the price paid. Perceived risk is an imperative factor that moderates the impact of coherence on brand or product evaluation (Campbell & Goodstein, 2001). Consumers seek to reduce the risk by purchasing products

from established or extended brands. Purchasing a product from an extended brand may minimize the level of risks, but it does not entirely eliminate them. DelVecchio & Smith (2005) claimed that brand extension price premiums are accepted because they reduce the perceived risk consumers feel when purchasing a new product. Milberg, Sinn, & Goodstein (2010) researched risk in association with competitive and noncompetitive settings of brand extension. These authors proposed that perceived risk mediates the influence of fit in noncompetitive settings and competitor brand familiarity in competitive settings. In non-competitive settings, the relationship between fit and evaluations are at least partially mediated by risk. DelVecchio & Smith (2005) found a positive relation of perceived fit between brand extension price premium and perceived fit, which was moderated by the level of risks. This study uses three types of risks identified in the DelVecchio & Smith (2005) study: financial, category, and social. Financial risk is the economic expenses that may accrue if a product does not perform appropriately; performance risk refers to losses associated with the product's failure to meet consumer's performance expectations; and social risk is the risk consumers face that their peers could evaluate them skeptically due to their purchase of a product (DelVecchio & Smith, 2005).

2.3 Knowledge

There is little research on the effect of expertise on consumer reason for choice. However, it is plausible to suspect that consumer reason for choice varies according to expertise. For example, consumers with little expertise on

cell phone categories may simply choose cell phones based on the popularity of brand, design, or other cursory attributes. On the other hand, consumers with high expertise may analyze each feature and tech specs. Past studies have found that low-familiar and high-familiar consumers tend to perceive better price-quality relationship than do moderately familiar consumers. Low-familiar consumers are more likely to adopt extrinsic information based on their belief; high familiar consumers are more likely to accept knowledge that a quality extrinsic cue association exists in the market (Rao & Monroe, 1988). Mitchell and Dacin (1996) found that consumers with increased levels knowledge made more conjectures about performance attributes from physical-attribute information when choosing between alternatives. Therefore, I suspect that both about parent brand and extended category is a necessary area to study in relation to brand extension success.

Traditionally, knowledge has been considered a one-dimensional construct. Most often, researchers in referring to prior knowledge have used, interchangeably, the terms familiarity (Ha & Perks, 2005; Park & Lessig, 1981, Rao & Monroe, 1988), expertise (Mitchell & Dacin, 1996), and experience. Alba & Hutchinson (1987) suggested that consumer knowledge be composed of two major components: familiarity and expertise. Familiarity is defined as the number of product-related experiences that a consumer has compiled. Expertise is the ability to perform product-related tasks appropriately (Alba & Hutchinson, 1987). Product-related tasks include advertising exposure, interactions with sales associate, product purchase, information search, decision making and product usage in different settings. Expertise concerns a much

deeper meaning than knowledge. An increase in familiarity results in an increase in expertise with a particular product, brand, or category. In our brand extension research, I study consumer knowledge in two different dimensions: parent brand knowledge and category knowledge.

2.4 Confidence

Consumer expertise is seldom thorough or errorless. Confidence has often been studied in relation to knowledge in the context of decision making (Carlson et al., 2009; Park & Lessig, 1981; Brucks, 1985; Park et al., 1994). Park & Lessig (1981) proposed that confidence in utilizing brand name is a function of consumer, decision maker, and familiarity. They find confidence increases monotonically with the level of familiarity. After having written an inclusive paper on consumer expertise (1987), Alba & Hutchinson (2000) wrote another one on consumer knowledge as it related to accuracy, calibration, and confidence. The authors find that confidence is dependent on consumer expertise, as well as other factors such as experience. The level of confidence consumers hold in their beliefs, knowledge, and predictions will impact the propriety of the actions consumers take. Moorman (1991) found similar results, observing that self-assessed knowledge and actual knowledge were weakly related and that information search was inversely related to self-assessed knowledge.

Confidence levels can be indicated by measures of subjective knowledge (Brucks, 1985). A recurring problem is knowing how to distinguish subjective knowledge from confidence, a problem investigated by Carlson et al

(2009). Subjective knowledge reflects one's perceived level of knowledge whereas confidence is how confident the individual is with respect to the accuracy of judgments or decisions. As seen through many studies, confidence is a necessary topic to be considered along with expertise in studying brand fit impact on brand extension. So far I have reviewed brand fit, risk, knowledge, and confidence under brand extension. In the next section, I lay out my research method and then the model used in this study.

3. Method

3. 1 Measure of Variables

Our main variable of interest is the subjective and objective fit. I simply follow the definition of subjective fit (SUB) by asking the fit of brand image between the parent and the extended brand. Aaker & Keller (1990) addressed the importance of dimensions of fit such as abstract attributes, complementarity, substitutability, and others. Nonetheless, all other studies on brand fit use different measures. For measures of objective fit (OBJ) Aaker & Keller's (1990) measures are implemented. In their study, three fit measures are used to measure categories. These three measures are complement, substitute, and transfer. Complement indicates the degree to which consumers view two product categories as complements. Substitute is the degree to which consumers view two product categories as substitutes. Transfer measures how consumers view relationships in product manufacturing. Of these three dimensions of objective fit, substitute turned out to be not as important as transfer and complement. Therefore, I use complement (COMP) and transfer (TRAN) as our measures of objective fit.

Following Alba & Hunchinson (1987), I measure knowledge in two dimensions, familiarity and expertise. Alba & Hunchinson (1987) argued that consumers with high expertise process information about different brands in greater depth than consumers with low expertise. Mitchell & Dacin (1996) also argued that consumers with high expertise also have greater attribute-performance knowledge, and should also have greater ability to compare the

attributes between in-product class than just indicate whether an object involves that attribute or not. Therefore, I measure expertise by asking the level of pros and cons of using a particular category, for extended category expertise and parent brand, for parent brand expertise and directly measure consumer's familiarity.

Self-confidence involves a subject's confidence with respect to a decision made. I measure it directly by asking a consumer's level of confidence in expertise. For all our dependent variables of familiarity (FAM), expertise (EXP), confidence (CONF), and preference (PREF), I measure within the dimension of both the extended category (represented with a "C" in front of the variable) and the parent brand (represented with a "B" in front of the variable)

I use surveying methods to obtain the data on brand extension and importance of fit for brand extension success. With measures developed in the previous section, I use existing brand but hypothetical extensions to control for exposure effect. Past research suggests that repeated exposure to an extended product may raise consumers' perceptions of fit. Greater exposure to the extended brand facilitates consumers to in identifying more shared attributes between the parent brand and the extended brand.

3.2 Pretest

A pretest was conducted on 168 subjects to test the moderating effects of knowledge, confidence, and the three types of risk and to select brands and the extension at various levels of brand fit. These subjects were asked to answer questions on subjective and objective fit of 12 brands and 8 extension

categories and finally asked to choose multiple brand extensions they thought they were likely to purchase. The original brands were selected with the criteria of being relevant and well known to all subjects, generally perceived as being of high quality, composed of local and global brands, and not broadly extended previously. These brands identified were Apple, Aveda, McDonalds, Haagen Daz, 3M, Incase, BYC, Kraze Burger, Morning Glory, Pulmuone, Missha, and SM Entertainment. The first five brands are global brands and the second five are local Korean brands. Based on the selected brands, eight categories that none of the selected brands had been entered into were identified to be used in the pretest. These categories were headphones, chocolates, movie theaters, toothpaste, beer, sunglasses, digital cameras, and sportswear.

Of the 168 that started the survey, only 82 subjects completed the survey. From these 82, I was able to find 4 brands and identify 2 high fit categories and 2 low fit categories, which added up to 16 brand extensions. The brands selected were Apple, McDonalds, Missha, Pulmuone; the categories selected were headphones, chocolates, movie theatres, and toothpaste. Using these 16 extensions of brands and categories, I collected consumers' perception of the extension as well as their knowledge of brands and categories, as can be found in Appendix 1.

3.3 Main Test

Subjects consisted of 200 university students. They were assigned to evaluate either Apple or Missha extending to four categories, or Pulmuone and McDonalds extending to four categories. There was a combination of 16 possible brand extensions in total and subjects were randomly assigned to each of two sets. Subjects ended up answering 4 different extensions, which added up to 800 data points for all 16 different extensions. The survey is provided in the Appendix.

4. Estimation

4.1 Multivariate Adaptive Regression Splines (MARS)

To flexibly model the high dimensional data, I follow Friendman's (1991) approach, the multivariate adaptive regression splines (MARS). The form of the model is expansion in product spline basis functions, where the data automatically determines the number of basis functions and the parameters associated with each one, such as product degree and knot locations. The MARS method generates a continuous model with continuous derivatives and has the capability and flexibility to model relationships that are additive or have interactions. Furthermore, MARS can also be described in a form that singly identifies the additive effects and those associated with the different multivariable interactions. The MARS model perfectly suits my objective to find significant variables that influence brand fit, as well as to find the optimal level of objective and subjective fit using the estimated model. The MARS model adequately approximates a function of many variables, given only the value of the function at various points among dependent variables (Friedman, 1991).

The success of brand extension is presumed to be described by

(1) $$\mathrm{INTEN} = \mathrm{f}(\mathrm{SUB}, \mathrm{OBJ}, \mathrm{PRISK}, \mathrm{SRISK}, \mathrm{FRISK}, \mathrm{CFAM}, \mathrm{CEXP}, \mathrm{CCONF}, \mathrm{BFAM}, \mathrm{BEXP}, \mathrm{BCONF}) + \varepsilon$$

The function is defined over some domain

$$(\mathrm{SUB}, \mathrm{OBJ}, \mathrm{PRISK}, \mathrm{SRISK}, \mathrm{FRISK}, \mathrm{CFAM},$$

$$\text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) \in \text{D} \subset \text{R}^{11}.$$

The deterministic function f, Equation (1), captures the joint predictive relationship of purchase intention (INTEN) on subjective fit (SUB), objective fit (OBJ), performance risk (PRISK), social risk (SRISK), financial risk (FRISK), category familiarity (CFAM), parent brand familiarity (PFAM), category expertise (CEXP), parent brand expertise (PEXP), category preference (CPREF), and brand preference (BPREF). ε is the additive stochastic component with the expected value defined as zero. Moreover, ε reflects the dependence of brand extension success on perceptions other than dependent variables that are neither controlled nor observed. The purpose of this regression analysis uses the data to construct a function f to perform as an acceptable approximation to f(SUB, …, BCONF) over the domain D of interest.

The objective here is to see how each variables influence subjective and objective fit and how subjective and objective fit influence the purchasing intention of a child brand and how the effects differ relative to the other type of fit. Therefore, I run simultaneous equations model where function of intention, subjective and objective fit are estimated simultaneously:

(2) $$\text{INTEN} = \text{f}(\text{SUB}, \text{OBJ}) + \varepsilon_1$$

$$\text{SUB} = \text{f}(\text{PRISK}, \text{SRISK}, \text{FRISK}, \text{CFAM}, \text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) + \varepsilon_2$$

$$\text{OBJ} = \text{f}(\text{PRISK}, \text{SRISK}, \text{FRISK}, \text{CFAM}, \text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) + \varepsilon_3)$$

where ε_1 , $\varepsilon_2, \varepsilon_3$ is the additive stochastic component with the expected value defined as zero. I separately run Equation (1) and (2) for these two models and explain their results.

4.2 Results

In Equation (1), I first estimate the impact of the subjective fit (SUB) and objective fit (OBJ) interaction with other variables of our interest on purchase intention. I include brand and category-specific dummy variables to see if consumer decisions varied under any specific brand and category combination.

I find that for subjective fit below 6, purchase intention decreases by -0.18381 and that for objective fit above 1.5, purchase intention increases by 0.22094. Category expertise, CEXP, also has a significant main effect; category expertise below 2 decreases purchase intention by -0.38074; category expertise above 2 decreases purchase intention by -0.18121. Performance risk is one of the factors consumers are conscious about. No matter how high the perceived subjective fit is, if perceived performance is moderate, or high, consumer's purchase intention decreases by -1.36997, more than any other effects captured.

Table 2. Estimates Results with Covariates

	Estimate	Std. Error	
Intercept	3.03803	0.29302	***
max(0, 6-SUB)	-0.18381	0.06734	**
max(0, OBJ-1.5)	0.22094	0.0677	**
max(0, CEXP-2)	-0.18121	0.05333	***
max(0, 2-CEXP)	-0.38074	0.15846	*
max(0, CEXP-2) * max(0, FRISK-5)	-0.11459	0.03253	***

max(0, CEXP-2) * max(0, 5-FRISK)	-0.05114	0.01436	***
max(0, PRISK-3) * max(0, 6-SUB)	-0.05118	0.01007	***
max(0, 3-PRISK) * max(0, 6-SUB)	-0.11248	0.02736	***
max(0, 6-PFAM) * max(0, OBJ-1.5)	-0.06954	0.01663	***
max(0, SRISK-6) * max(0, 6-SUB)	0.06855	0.02701	*
max(0, 6-SRISK) * max(0, 6-SUB)	0.06011	0.01086	***
max(0, CEXP-2) * max(0, SUB-2)	0.08849	0.02101	***
max(0, CEXP-2) * max(0, 2-SUB)	0.19669	0.05228	***
max(0, CCONF-3) * max(0, OBJ-1.5)	0.07015	0.01847	***
max(0, 3-CCONF) * max(0, OBJ-1.5)	0.19817	0.07293	**
max(0, PRISK-2) * max(0, SUB-6)	-1.36997	0.39747	***
max(0, PCONF-4) * max(0, OBJ-1.5)	0.08215	0.02901	**
C1″	0.33153	0.11523	**
C2	0.22	0.11419	.
C3	0.13258	0.11718	
B1	0.13312	0.12869	
B2	0.0985	0.12515	
B3	0.04843	0.12198	

Note: Headphone: (C1, C2, C3)=(0,0,0); Movie Theater: (C1, C2, C3)=(1,0,0); Toothpaste: (C1, C2, C3)=(0,1,0); Chocolate: (C1, C2, C3)=(0,0,1)

Note: Apple: (B1, B2, B3)=(0,0,0); Pulmuone: (B1, B2, B3)= (1,0,0); Missha: (B1, B2, B3)=(0,1,0); McDonalds: (B1, B2, B3)=(0,0,1);

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 2 shows that the estimation of covariates is not significant except in two categories, movie theaters and toothpaste, which showed significance at 0.1 and 0.05 levels. Since these covariates showed significance at low levels, I conclude that the covariates have no effect on the model and that all categories and brand extension combinations are not different from that of baseline category and brand. Therefore, I do not include the covariates when running Equation (2) and for any other models after.

Significant variables and estimation values from the simultaneous equation model, Equation (2), are shown in Table 3. Except for category expertise, I find significant effects for all the variables. Although most variables have a similar effect on both subjective and objective fits, almost all variables have slightly greater, through minor effect on subjective fit.

Table 3. Simultaneous Equations Model Estimation

	SUB			OBJ		
Variable	Estimate	Std. Error		Estimate	Std. Error	
Intercept	3.212115	0.205735	***	3.332453	0.211797	***
max(0, 6-SRISK)	0.513452	0.037128	***	0.43107	0.038222	***
max(0, PRISK-2)	-0.30017	0.036267	***	-0.34713	0.037335	***
max(0, 2-PRISK)	-0.86526	0.208331	***	-0.96621	0.21447	***
max(0, PEXP-6)	-0.81773	0.300835	**	-1.20699	0.3097	***
max(0, 6-PEXP)	-0.19818	0.033271	***	-0.20448	0.034252	***
max(0, CCONF-6)	0.387432	0.193164	*	0.443995	0.198856	*
max(0, 6-CCONF)	-0.14611	0.037344	***	-0.1344	0.038444	***
max(0, CFAM-3)	-0.0718	0.029807	*	-0.07565	0.030685	*
max(0, PCONF-4)	0.19486	0.076663	*	0.26427	0.078921	***
max(0, FRISK-3)	0.355165	0.063483	***	0.360392	0.065353	***
max(0, PFAM-5)	-0.209	0.072657	**	-0.17199	0.074798	*
max(0, FRISK-5)	-0.59571	0.137287	***	-0.59559	0.141332	***

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

	INTENT		
Variable	Estimate	Std. Error	
Intercept	4.857152	0.123743	***
max(0, SUB-6)	0.726441	0.348691	*
max(0, 6-SUB)	-0.29095	0.0569	***
max(0, 6.5-OBJ)	-0.31185	0.056578	***

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

With subjective fit above 6, purchase intention increases by 0.726. For subjective fit below 6 and objective fit below 6.5, purchase intention decrease by -0.29095 and 0.31185, respectively. Low levels of objective fit would decrease the purchase intention by 0.31885 but a high level of objective fit has no effect on purchase intention. Results show how subjective and objective fit changes with respect to three risks and category and parent brand preference, confidence, and expertise. Since I am interested in how the subjective and objective brand fit is moderated by covariates, I estimate another model where the main effects are only allowed for subjective and objective fit while other covariates are allowed to enter as interaction terms only.

Here I introduce other covariates: category preference (CPREF) and parent brand preference (PPREF). I am not interested in these covariates but it is introduced to see any possible effect in relation to other variables. Second degree interaction is found to have the best BIC value of 2782 and the results are as below:

Table 4. Estimation with Interaction in Covariates

Variable	Estimate	Std. Error	
Intercept	3.142951	0.227366	***
max(0, SUB-6)	2.251613	0.618689	***
max(0, 6-SUB)	-0.1444	0.05737	*
max(0, OBJ-1.5)	0.163205	0.062059	**
max(0, PRISK-3) * max (0, 6-SUB)	-0.05048	0.009388	***
max(0, 3-PRISK) * max(0, 6-SUB)	-0.09274	0.025286	***
max(0, 6-SRISK) * max(0, 6-SUB)	0.046145	0.009514	***
max(0, PCONF-5) * max(0, PPREF-6)	1.857898	0.282888	***
max(0, 5-PCONF) * max(0, PPREF-6)	1.649505	0.597844	**
max(0, CEXP-2) * max(0, PPREF-6)	-0.59803	0.180976	***

max(0, 2-CEXP) * max(0, PPREF-6)	-2.97547	0.706083	***
max(0, OBJ-1.5) * max(0, 3-CPREF)	-0.24949	0.052466	***
max(0, PEXP-2) * max(0, 6-SUB)	-0.02602	0.007979	**
max(0, 3-PFAM) * max(0, 6-PPREF)	-0.11683	0.020844	***
max(0, CCONF-3) * max(0, OBJ-1.5)	0.09578	0.020233	***
max(0, 3-CCONF) * max(0, OBJ-1.5)	0.253273	0.070611	***
max(0, PCONF-5) * max(0, SUB-6)	-1.58093	0.477577	***
max(0, 5-PCONF) * max(0, SUB-6)	-1.06045	0.252014	***
max(0, PEXP-5) * max(0, PPREF-6)	0.825484	0.273711	**
max(0, 5-PEXP) * max(0, PPREF-6)	2.544904	0.777181	**

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

MARS finds three main effect splines of subjective fit greater than 6, subjective fit less than 6 and objective fit greater than 1.5 Subjective fit greater than 6 increases purchase intention by 2.251613 which is larger than any other main effects. Subjective fit less than 6, on the other hand, decreases purchase intention by -0.1444. Objective fit greater than 1.5 increases purchase intention by 0.163205. These three splines capture large effects while other interaction effects are relatively marginal. Interestingly, financial risk and category familiarity nodes are not captured in this analysis.

5. Simulation

5.1 Single Variable Simulation

To show how few variables of interest influence purchase intention, all other variables should be controlled. I use a simulation method to be able to control for variables outside my interest. The detailed simulation procedure is as follows:

Step 1. Since each variable is measured on a 7 point Likert scale, I divide each scale into 10 discrete points to be able to capture effects at small points. Therefore, I generate 70 points from 0.1 to 7 for each variable of interest and these points are listed in lexicographical order. For example, I am interested in capturing effect of performance risk on intention through subjective fit, so I generate 70 points for performance risk and 70 points on subjective fit. These 70 points in combination will produce 4900 discrete points on which the effect of performance intention could be mapped.

Step 2. Values of other variables are randomly generated and for each of 4900 discrete points. For variables not of interest, 1,000 values are randomly generated.

Step 3. For one discrete point, 1,000 generated values are plugged into the estimated model. There are 1,000 results and these are averaged. The average is the controlled effect of other variables not of interest.

Step 4. Repeat the procedure for all 4,900 points.

Using a simulation method, I find each covariate impact on purchase intention through subjective fit, (see Figure 1), which is compared with covariate impact on purchase intention through objective fit, (Figure 2).

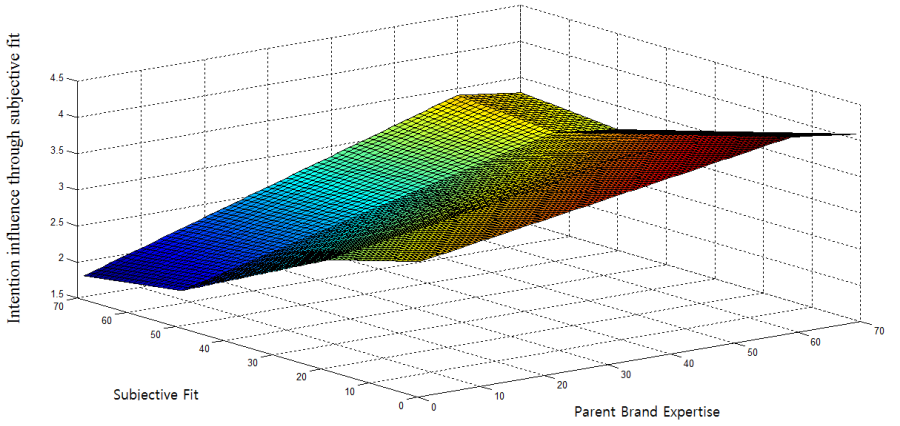


Figure 1. Impact of Parent Brand Expertise and Subjective Fit on Purchase Intention

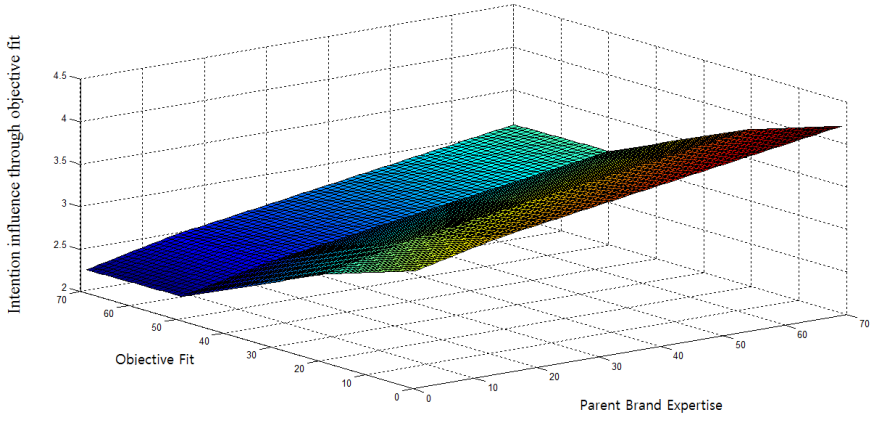


Figure 2. Impact of Parent Brand Expertise and Objective Fit on Purchase Intention

From Figures 1 and 2, purchase intention for each parent brand expertise point was averaged. Using these averaged purchase intentions, Figure 3 shows the parent brand expertise (PBEXP) impact on purchase intention through objective and subjective fits compared on the same axis. I find that when parent brand expertise is below 3.254, objective fit has a higher impact on purchase intention than does subjective fit. When parent brand expertise is above 3.254, subjective fit increases purchase intention more than does objective fit does. The cutoff point is 3.254, where the subjective fit and objective fit impose the same purchase intention.

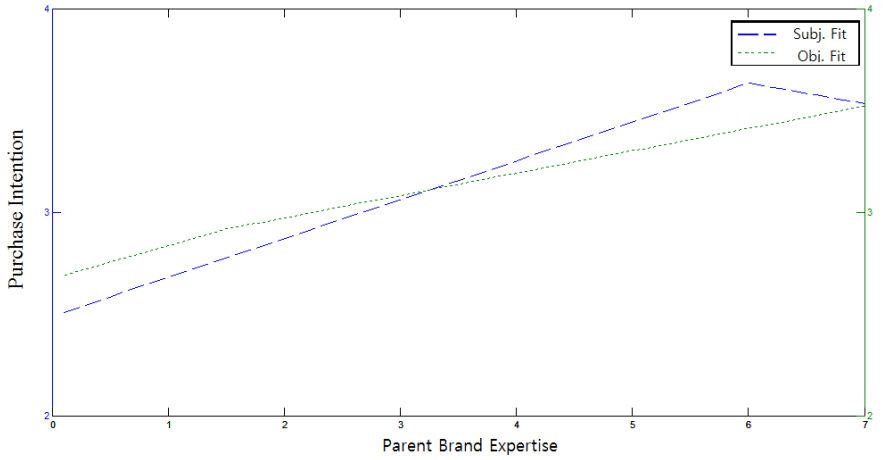


Figure 3. Purchase Intention Change with Change in Parent Brand Expertise

Figure 2 shows the difference in purchase intention for subjective and objective fits when variables other than parent brand expertise are controlled. When the parent brand expertise is greater than the cutoff point, 3.254, the subjective fit has greater impact on purchase intention and this difference reaches maximum when parent brand expertise is 6.

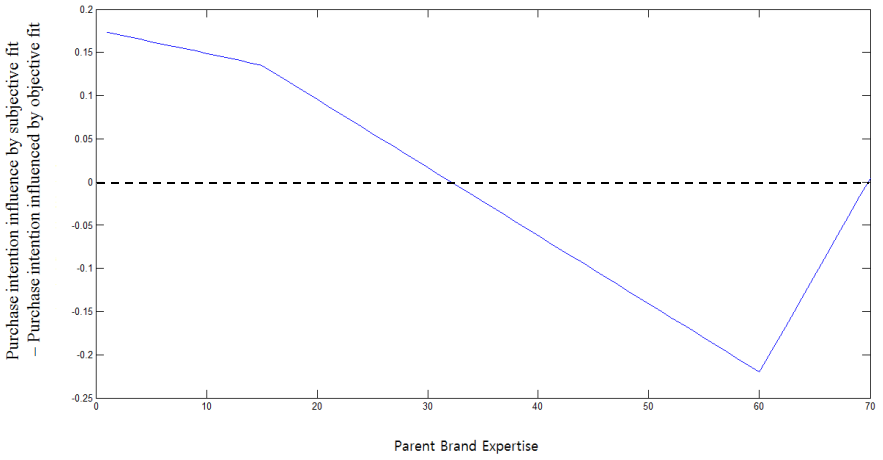


Figure 4. Difference of Purchase Intention Change with Change in Parent Brand Expertise with Respect to Subjective Fit and Objective Fit

So far I have evaluated purchase intention change with respect to parent brand expertise only. Cutoff points for all other covariates are provided in Table 5.

Table 5. Cutoff Points for all Covariates

Variable	Cutoff Point	If X>Cutoff
Category Expertise	3.231	Subjective fit > Objective Fit
Category Confidence	3.306	Subjective fit > Objective Fit
Parent Brand Familiarity	3.338	Subjective fit > Objective Fit
Parent Brand Expertise	3.254	Subjective fit > Objective Fit
Parent Brand Confidence	3.429	Subjective fit > Objective Fit
Social Risk	3.402	Subjective fit > Objective Fit
Performance Risk	3.228	Subjective fit > Objective Fit

Cutoff Point: When intention through subjective fit = intention through objective fit

It is important to note that I find cutoff points for all variables at relatively similar places. For instance, the cutoff point for category expertise is 3.231 and the cutoff point for parent brand familiarity is 3.338. Cutoff points

for all variables are similar because main effect is significantly large and these variables are not captured as the main effects. Cutoff points are shifted only through marginal interaction effects and therefore cutoff points are relatively similar for all variables.

5.2 Bootstrap

Although the simulated results show that change in purchase intention through subjective and objective fit differ, it does not tell us whether their difference is significant. Hence, I use bootstrapping methods to test,

Ho: Intention through objective fit – Intention through Subjective fit =0.

Using bootstrapping methods, error band for the difference in intention is developed at a 95% confidence level.

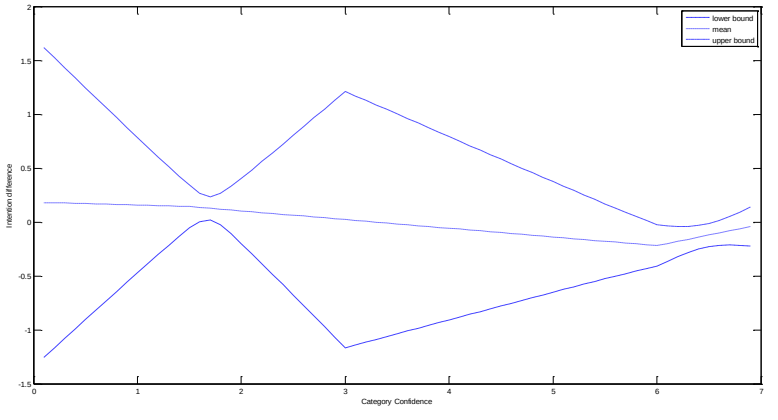
Table 6. Insignificant Region for Ho

Variable	Ho*Insignificant Region
Category Expertise	None
Category Confidence	1.6-1.7
Parent Brand Familiarity	None
Parent Brand Expertise	0.1-2.0
Parent Brand Confidence	None
Social Risk	1.5-2.2
Performance Risk	None

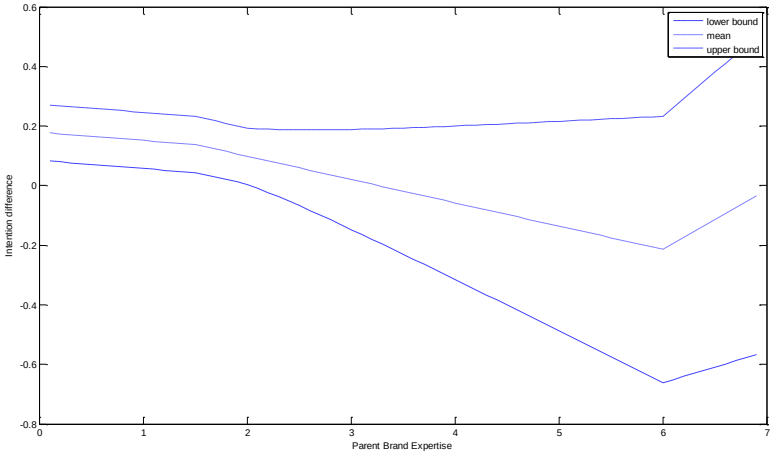
*Ho: Intention through objective fit - Intention through subjective fit =0

Error bands that include 0 at all regions mean that the null is significant and that there is no difference between the purchase intention through objective fit and subjective fit. The null hypothesis for category expertise, parent brand familiarity, parent brand confidence, and performance risk are not rejected and are significant at all regions of the variable. However, category confidence, parent brand expertise and social risk have significant null at particular regions noted in Table 6. Graph 5 displays the error bands for three variables with insignificant null at a particular region.

(a) Category Confidence



(b) Parent Brand Expertise



(c) Social Risk

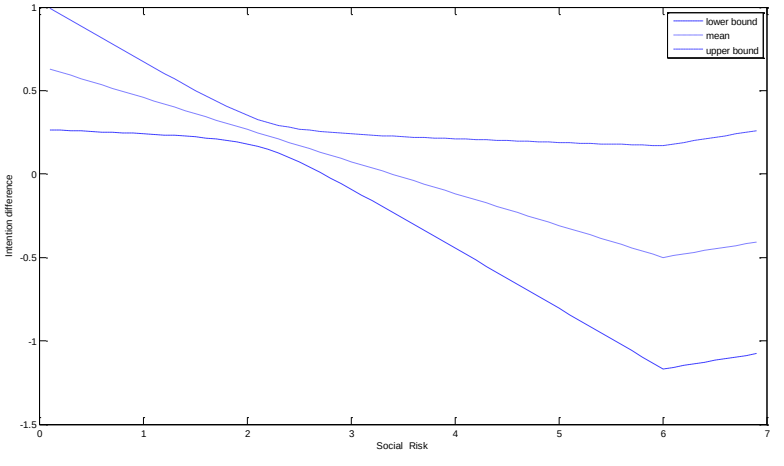


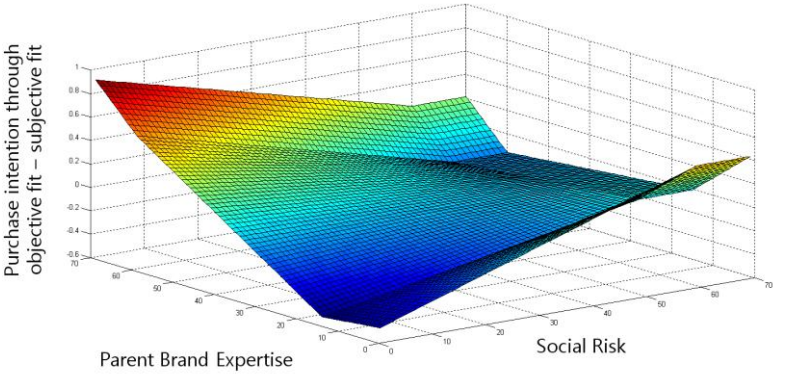
Figure 5. Error Band for Variables with Insignificant Regions for Ho

5.3 Double Variable Simulation

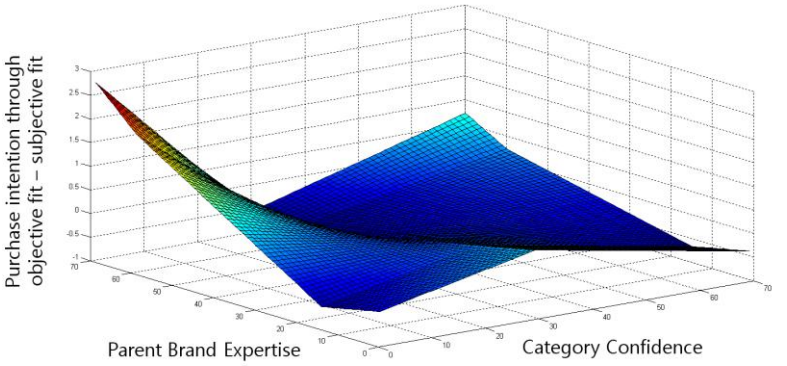
To map two covariates affecting purchase intention at the same time, I use three variables- parent brand expertise, category confidence, and social risk- with different perceived levels of purchase intention through subjective and

objective fit. To find the impact of two covariates on purchase intention through subjective and objective fit, I use the same simulation method but insert another set of 70 generated points to our 4900 points, totaling 343000 points. I control for other variables and map pairs, parent brand expertise vs. social risk, social risk vs. category confidence, and parent brand expertise vs. category confidence, influence on purchase intention through subjective fit and objective fit. The difference of purchase intention generated through objective fit and subjective fit is shown in Figure 6. Since the paper's main interest is to configure when purchase intention through subjective fit is higher than objective fit or vice versa, I generate 2-dimentional graphs showing regions with higher purchase intention through subjective fit or objective fit.

(a) Social Risk vs. Parent Brand Expertise



(b) Category Confidence vs. Parent Brand Expertise



(c) Category Confidence vs. Social Risk

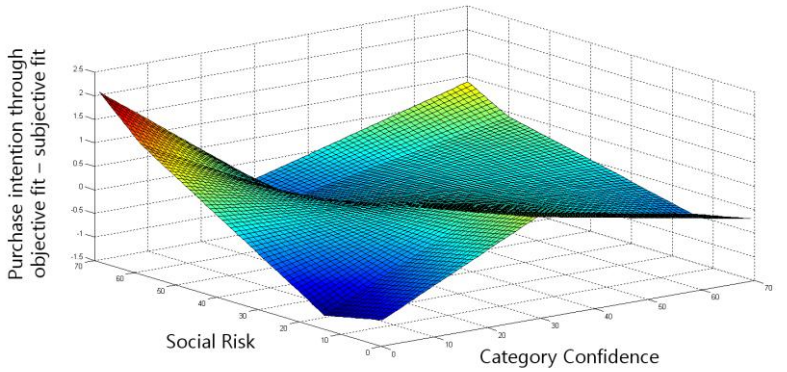
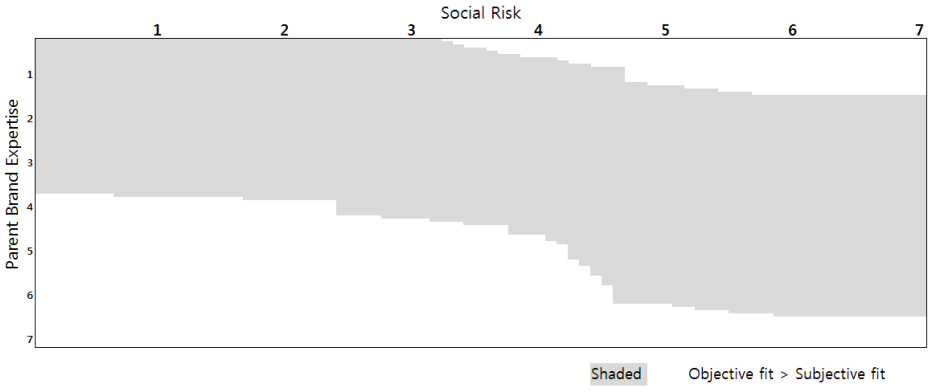
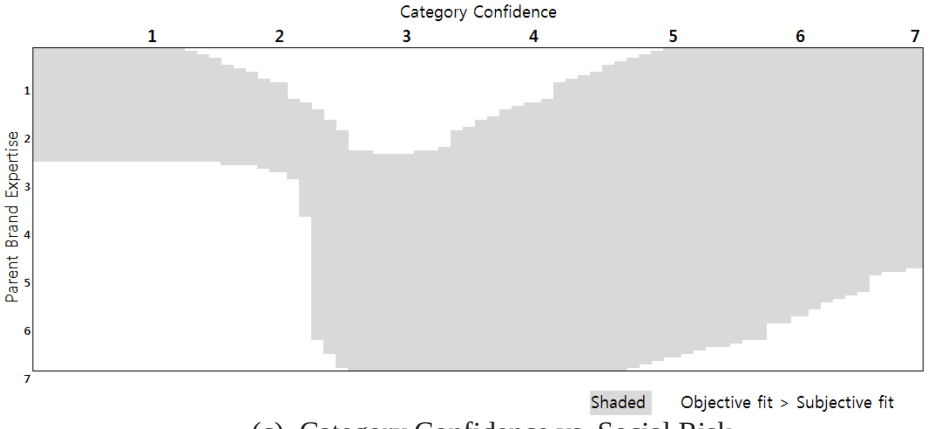


Figure 6. Difference of Purchase Intention Generated through Objective fit and Subjective Fit for Parent Brand Expertise vs. Social Risk, Social Risk vs. Category Confidence, and Parent Brand Expertise vs. Category Confidence

(a) Social Risk vs. Parent Brand Expertise



(b) Category Confidence vs. Parent Brand Expertise



(c) Category Confidence vs. Social Risk

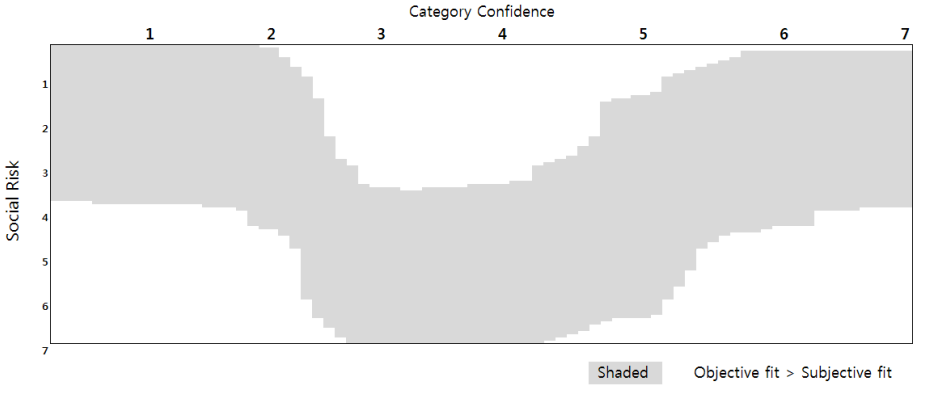


Figure 7.Color Graph of Extent of Purchase Intention Generated Through Subjective Fit or Objective Fit

Figure 7 shows that there are clearly interactions between parent brand expertise vs. social risk, social risk vs. category confidence, and parent brand expertise vs. category confidence. In Figure 7, when perceptions of any two variables are both high, consumers generate more purchase intention through subjective fit than objective fit. On the other hand, when perceptions of any two variables are both low, consumers generate more purchase intention through objective fit than subjective fit. This result corresponds with the result from Figure 3, which show that consumers generate more purchase intention through subjective fit than objective fit for any single variable when their perception of the variable is high. Greater subjective fit at high perception, for any single varying variable explains why, in Figure 7, the purchase intention generated through subjective fit is greater than objective at right hand corners (i.e., high perception for both variables) in Figure 7. Similarly, when perception of a variable is low, consumers generate more purchase intention through objective fit than subjective fit.

When consumers lack extensive expertise of a brand, they are left with only category information of the product to decide whether to buy the new product or not. Therefore, when consumers perceive little much social risk, or have low confidence about their expertise of the category, consumers are more likely to use category similarity to serve as a measure of high quality. Hence, consumers are likely to perceive greater purchase intention through objective fit than subjective fit.

At high levels of parent brand expertise and low levels of social risk or category confidence, consumers generate purchase intention through subjective

fit. Since consumers have extensive expertise with brand, they use as a cue to purchase the new product, the similarity of brand information between the parent and the extended brand.

When the social consequences of purchasing a product (i.e., social risk) are very high for a consumer but their confidence of the category expertise is low, consumers rely, when purchasing a new product, on how the product is visibly branded. Therefore, subjective fit generates greater purchase intention than objective fit at high levels of social risk and low levels of category confidence. Similarly, when social risk is high and parent brand expertise is very low, consumers rely on written and pictorial product descriptions of the product (DelViccio, 2009). Therefore purchase intention generated through subjective fit is greater and that of objective fit.

At high levels of both social risk and category confidence, consumers are already confident about the category that the new product is in but sense great risk about it being vulnerable to peer evaluation. Therefore, consumers prefer a visibly branded product and in using a criterion to purchase the new product are left with the similarity of the brand. To generate purchase intention, consumers rely on subjective fit. On the other hand, when social risk is low, consumers have no incentive to prefer a visibly branded product but they are highly confident of their expertise about the category. Therefore, for purchase intention, they rely on objective fit. Similarly, with a high level of category confidence and a low level of parent brand expertise, consumers naturally generate more purchase intention through the criterion they know best.

Therefore, purchase intention generated through objective fit is higher than subjective fit.

At mid to high levels of category confidence, consumers are more likely to depend on category fit to evaluate their purchase intention unless consumers have exceptionally high parent brand expertise.

When consumers have at least minimal confidence in the category (i.e., moderate category confidence), it depends on the level of social risk whether greater purchase intention is generated through objective fit or subjective fit. At high levels of social risk, consumers will have greater purchase intention when the category of the new product is similar to the existing product (i.e., objective fit). At lower levels of social risk, consumers face little risk in their decision making. Therefore, they have little incentive to rely on objective fit because they do not have much confidence about their expertise of category. Therefore, consumers are more likely to generate purchase intention through subjective fit than objective fit.

6. Conclusion

This study has shed light on the factors that may affect brand extension success by influencing subjective and objective brand fit. I estimate three models: 1) covariates' (including category- and brand-specific dummy variable) impact on purchase intention, 2) simultaneous equation model of subjective fit, objective fit, and purchase intention, and 3) covariates' impact on purchase intention (interaction only allowed for brand fit variables). Simulation methods are used to find particular variables' solo effect on brand fit, therefore influencing purchase intention.

This study has shown, through our simultaneous equations model, that consumers weigh objective fit more heavily than subjective fit. This result also aligns with the fact that performance risk had the strongest influence on purchase intention. Since consumers are quite conscious about performance risk, it is natural that they would refrain from purchasing brand extensions that are in a totally new category from that of the parent brand. Therefore, managers should try to brand extend to an appropriate category. Nevertheless, subjective fit is still an important factor and it should also be carefully considered.

The simulation study also showed how subjective and objective fits are moderated through covariates. Since the model did not allow for a main effect of covariates, the result showed little variation effect from all of the covariates. Therefore, a future study should allow for the main effect of the covariate.

Another limitation of the study is that I was unable to measure subjective fit in a multidimensional construct. A future study should refine the

definition of subjective fit and try finding any constructs that could be seen as a subjective fit between a parent and child brand.

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Appendix: Measurement Scales

Part 1: Measure of fit

Subjective Fi

Q: How much do you think the image of Apple coincide with the image of following brand?

Q: How much do you think the new product will strengthen the image of Apple?

Objective Fit

Complement

Q: Can two products be jointly consumed to satisfy some particular need?

Transfer

Q: Do you feel that the people, facilities, and skills a firm uses to make the original product would transfer and be employed effectively in designing and making the product extension?

Part 2: Measure of Extension Success

Q: How likely are you to purchase the product?

Q: What is your preference of following brand?

Q: What is your preference of following category?

Part3: Measures of Risk

Performance Risk

Q: If you buy the following product, how likely are you to have problems with the performance?

Social Risk

Q: If you buy the following product, do you think other people are likely to negatively evaluate your purchase?

Financial Risk

Q: If you buy the following product, how likely are you to regret purchasing it given the financial commitment?

Part4: Measures of Knowledge and Confidence

Brand

Familiarity

Q: How familiar are you with the given brand?

Expertise

Q: How likely are you to know about pros and cons of using following brand compared to other similar brands?

Confidence

Q: How confident are you with your judgment of knowing pros and cons of using the following brand?

Category

Familiarity

Q: How familiar are you with the given category?

Expertise

Q: How much pros and cons do you know about this product/service over other substitutable products or services?

Confidence

Q: How confident are you about your judgment of knowing pros and cons of the following product?

국 문 초 록

특정 브랜드가 새로운 상품군에서 새로운 브랜드로 확장하는 경우, 두 브랜드의 브랜드 적합성 (brand fit)에 따라 성공여부가 달라질 수 있다. 기존의 많은 연구들이 브랜드 적합성이 브랜드 확장에 어떠한 영향을 주는지 연구해 왔으나, 소수의 연구만이 브랜드 적합성을 구체적으로 세분화 시켰다.

일반적으로 브랜드 적합성은 크게 모 브랜드와 자 브랜드의 이미지 적합성을 고려한 주관적 적합성 (subjective fit)과 카테고리 적합성을 고려한 객관적 적합성 (objective fit) 으로 나누어 지는데, 성공적인 브랜드 확장을 위한 각 적합성의 상대적 정도를 비교한 연구는 많지 않았다. 본 연구에서는 브랜드 확장시, 고객이 인지하는 위험도(risk)에 따라 객관적 적합성과 주관적 적합성의 상대적인 중요도가 어떻게 달라지는지를 살펴 본다.

DelVecchio and Smith (2005) 에 다르면, 위험도는 성능적 위험 (performance risk), 금전적 위험 (financial risk) 그리고 사회적 위험 (social risk)등으로 나뉘는데 이 위험도들은 상품군 또는 브랜드에 대한 고객의 지식(knowledge)에 따라 달라진다.

고객의 지식은 친근도 (familiarity)와 전문성 (expertise)으로 나뉘며, 이 중 전문성은 신뢰도 (confidence)와 근접한 영향이 있다고 Carlson et al.,(2009), Park and Lessig (1981), Brucks (1985), 그리고 Park et al., (1994) 등의 논문에서 언급되었다. 본 연구에서는 이러한 친근도, 전문성, 그리고 신뢰도를 각각의 브랜드에 대해, 상품군에 대해 나누어 측정하였다. 좀 더 구체적으로는, 설문 방법을 이용하여 4 개의 다른 브랜드가 4 개의 다른 상품군 안에 확장 했을 때 고객의 선택여부, 또는 선호도와 고객이 인지 하는 위험도, 지식, 신뢰도 등에 대하여 정보를 얻고,

이를 Friendman (1996) 의 다변량 적응회귀스플라인모형 (Multivariate Adaptive Regression Splines model)의 모형을 실증적으로 검토 하였다. 다변량 적응회귀스플라인모형을 이용하여 다음 3 개의 모형을 추청한다. 1) 카테고리와 브랜드의 더미를 추가한 변수들이 구매의향에 미치는 효과 모형, 2) 주관적 적합성, 객관적 적합성, 그리고 구매의향의 동시방정식 모형, 3) 공변량이 구매의향에 미치는 효과 모형 (공변량은 상호작용에만 허용)

고객은 주관적 브랜드 적합성 보다 객관적 브랜드 적합성에 더욱 무게를 두고, 이와 같은 결과는 성능적 위험이 구매의향에 미치는 효과가 모든 변수 중 가장 크다는 결과와 같은 맥락에 있다. 고객은 브랜드 확장이 된 물건을 구매할 때 성능적 위험에 가장 많은 무게를 두고 고려하기 때문에 기존의 카테고리와 상이한 카테고리에 신제품을 냈을 때 구매 의향이 가장 크다라는 결과를 도출 하였다.

본 연구는 브랜드 확장의 성공을 위한 가장 이상적인 브랜드 적합성의 정도를 파악할 수 있다는 것에 그 의의가 있다.

주요어: 브랜드 확장, 브랜드 적합성, 다변량 적응회귀스플라인모형 (MARS), 위험, 신뢰, 지식
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The Relative Effect of Subjective and Objective Fit on Brand Extension Success

주관적 브랜드 적합성과 객관적 브랜드적합성이 브랜드 확장에 미치는 상대적 영향에 대한 연구

2014 년 2 월

서울대학교 대학원

경영학과 경영학 전공

남예지

The Relative Effect of Subjective and Objective Fit on Brand Extension Success

지도교수 김진교

이 논문을 경영석사학위논문으로 제출함

2014 년 2 월

서울대학교 대학원

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Abstract

This paper focuses on the relative importance of subjective and objective fit on brand extension success. Brand fit refers to consumer perceptions on the degree of similarity or correspondence between a parent brand and the extended brand. To evaluate brand fit, consumers often use both objective and subjective measures. A subjective fit measures the similarity in brand image; an objective fit measures the similarity of the category of the brand.

This paper details the relative importance of each of the fit criteria in brand success. Specifically, it examines their importance when risks (social, financial and performance) are associated with a purchase. It also examines their importance when consumer knowledge- both familiarity and expertise- of the parent brand and of the extended category and the expertise is also related to confidence.

I use survey methods to collect data on subjective and objective fits, consumer risks, knowledge, and confidence on category as well as the parent brand, and purchase intention for various number of brand extensions. I then model it using nonparametric Multivariate Adaptive Regression Splines model (Friendman, 1991). I estimate three models: 1) the covariates' (including a category and a brand-specific dummy variable) impact on purchase intention, 2) asimultaneous equation model of subjective fit, objective fit, and purchase intention and 3) the covariates' impact on purchase intention (interaction allowed only for brand fit variables). Then simulation methods are used to find

the relative purchase intention through two types of brand fit for any single variable while controlling for effects of other variables. Next, the bootstrapping method is used to test whether the influence of subjective and objective fit are equal for each variable. With the result from bootstrap, a simulation method is used once again to find the relative purchase intention through two types of brand fit when two variables are considered at the same time while controlling for effects from other variables.

From our simultaneous equations model, I find that consumers weigh objective fit more heavily than subjective fit. When any single variable is considered for finding purchase intention, objective fit has a greater influence at low perception levels and subjective fit has a greater influence at high perception levels, regardless of variable type. The hypothesis -that the influence of subjective and objective fit is equal- is supported for three variables: extended category confidence, social risk, and parent brand expertise (i.e., these variables had similar purchase intention influence through subjective and objective fits). Relative purchase intention through subjective and objective fit, in a combination of two of three variables, are overlooked.

Keywords: Brand Extension, Brand Fit, Multivariate Adaptive Regression Splines model, Risk, Confidence, Knowledge

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1. Introduction

Whenever a company has a new product that it wants to introduce to the market so it can extend its brand, it faces a threefold challenge—keep the cost of the introduction relatively low, make it succeed, and ensure its growth. Finding ways to do this is the job of brand marketers. One way of reducing the risk of failure is to introduce the product under the aegis of an established brand name. Such a method of putting out a new product is known as a brand extension and it is much less costly than building a new brand. Indeed, approximately 80 to 90 percent of new products in any given year are brand extensions (Keller, 2008). A typical brand extension applies a parent brand name to a new product in a category that is either a high category fit or a low one, and in so doing exploits the value of the well-established brand equity of the parent brand name.

Brand extensions can be either horizontal or vertical. Horizontal brand extension applies an existing brand name to a new product produced either in a related product category (i.e., high category fit) or in a product category entirely new to the firm (i.e., low category fit). Vertical brand extension introduces a brand extension in the same product category (i.e., high category fit) as the parent brand, but at a different price point or quality level. A second brand, in vertical brand extension, is usually introduced close to the core brand to display the link between the parent and the extended brand (Kim & Lavack, 1996) because parent brand familiarity assists new product introduction in the market.

Whether it is a vertical or horizontal brand extension, an important factor for brand extension success is the fit between the parent and the extended brand. Researchers who have studied moderators of brand extension success or failure have looked at a wide variety of moderators: brand strength, symbolic value, order of entry, firm size, firm's marketing competency (Reddy et al., 1994), fit between the parent brand and the extension product, marketing support, parent-brand confidence, and retailer acceptance (Völckner and Sattler, 2006). What they have found to wield a substantial effect on a brand's success are the following items: inherent popularity of the extension category, fit between the parent brand and the extension product, marketing support, parent-brand confidence and retailer acceptance. Because of its importance to the success of a brand extension, fit has emerged as a critically important research topic, Nevertheless, there has been limited study on the relative importance of subjective and objective fit.

Adweek has reported the 10 best and worst brand extensions. It considered the best to be Nestlé Crunch Girl Scout Cookie Candy Bars and the worst to be Zippo the women's perfume. In terms of categories (i.e., the objective fit), Nestlé is clearly a better fit with Girl Scout Cookies than Zippo is with perfume. However, Zippo's subjective fit—its product design or image is not at all distant from that of the zippo perfume. So which is more important—the subjective or objective fit? This question touches on what I seek to answer in this paper: What is more important to the success of a brand extension: subjective fit, objective fit, or are they equally important? A brand extension is most likely to succeed under what conditions?

While many studies have researched the importance of the fit, prior brand extension fit research has not distinguished between subjective and objective fits. I seek to fill this gap by studying the relative importance of subjective and objective fit criteria on consumer preferences. This paper also contributes by reviewing numerous studies on brand extension as well as proposing a concrete scale to measure both subjective and objective fits. Moreover, I discern the conditions for the relative importance of subjective and objective fit for brand extension success.

The rest of this paper is organized as follows. In Section 2, I review previous studies on brand extension success, brand fit, and how familiarity, expertise and confidence are important variables related to brand extension success. Section 3 explains how I used surveying methods to collect data on subjective fit, objective fit, brand and category knowledge, confidence and consumer choice (or preferences) for various numbers of brand extensions; the section then goes over the pretest and main test. In Section 4, I propose using multivariate adaptive regression splines (MARS) model and how this model suits the purpose of the study; the section then discusses the results after running the MARS model. In Section 5, I discuss simulation results and bootstrapping results to find the error bands of the difference in intention generated through subjective fit and objective fit. Section 6 ends the paper with a discussion of the implications and suggestions for future research.

2. Literature Review

2.1 Brand Fit

The related literature to this study has mainly researched advertising, consumer knowledge, associations, consistency, risk, regret, overconfidence, and brand image in relation to brand fit. Volckner and Sattler (2006) empirically displayed mediating and moderating factors between a broad set of variables of brand extension success. They found that the fit between the parent brand and the extended product is significant, and it is the most important driver on extension success. As consumers perceive greater fit, the greater the degree in which consumers view the preference of the extending brand to carry over to its new product category (Barta et al., 2010). The area with the greatest number of studies in association to brand fit is advertising, particularly exposure of the brand name through advertising (Bridges et al., 2000), priming (Nakamoto 1990; Bettman & Sugan, 1987; Zhang & Sood, 2002; Yeung & Wyer, 2005; Bambauer-Sachse, Huttl, and Gierl, 2011; Klink & Smith, 2001), and distancing (Kim, Lavack, & Smith, 2001). Particularly, Bambauer-Sachse, Huttl, & Gierl (2011) showed that advertisement elements linked with the parent brand could build an association between the parent and the extended brand and thus strengthen the perceived fit. Similarly, increased exposure of brand could help aid information retrieval processes resulting in improved fit perceptions (Klink & Smith, 2001) and also attenuate incongruent extensions (Lane, 2010).

Table 1. Brand Fit Research Topics

Topic	Relevant Literature
Conceptualization and empirical evidence on the two dimensions of the fit construct	Bhat & Reddy, 1997, 2001; Bridges, Keller, & Sood, 2000; Park, Milberg, & Lawson, 1991; Swaminathan, Fox & Reddy, 2001
Brand advertising can improve fit perceptions:	
Exposure	Klink & Smith, 2001 ;Lane, 2000
Priming	Bambauer-Sachse, Huttl, & Gierl, 2011; Boush, 1993; Chakravarti, Pryor & Brodie, 1998; Zhang & Sood, 2002
Distancing	Kim, Lavack, & Smith, 2001
Consumer knowledge and Experience with past extension	Aaker & Keller, 1992; Boush & Loekn, 1994; Czeller, 2003;
Associations	Broniarczyk &Alba, 1994; Bhat & Reddy, 2001; Bridges, Keller & Sood, 2000; Chakravarti, MacInnis & Nakamoto, 1990; Czeller, 2003; Park, Milberg & d Lawson, 1991
Consistency (congruency)	
of personality dimension	Lau & Phau, 2007
of brand concept	Park, Milberg & Lawson, 1991
of common usage or goal	Martin & Stewart, 2001; Park, Milberg & Lawson, 1991
Risk	DelVecchio & Smith, 2005; Campbell & Goodstein, 2001; Milberg, Sinn & Goodstein, 2010
Brand Image	Aaker & Keller 1992; Bhat & Reddy, 2001; Salinas & Perez, 2008

Park, Milberg and Lawson (1991) distinguished two types of similarity conceptions that affect the perception for brand extension. The first type is product feature similarity perception which identifies concrete (feature correlations, attribute matching, etc.) or abstract (shared-usage situations, etc.) features between the parent and the extended brand. Concept consistency perceptions rely on the extended product's ability to grasp the brand concept (Park Milberg & Lawson,1991). Bhat & Reddy (2001) viewed the extension fit as being two dimensions of product category fit and brand image fit. Product category fit is defined as consumers' perceptions of the similarity of the product categories of the parent and the extended brand. Brand image fit refers to consumers' perceptions of the similarity between image of extended brand and the parent brand. Lastly, Mao and Krishnan (2006) claimed that brand extension fits can be perceived by calibrating brand prototype or product exemplar. Prototype fit is defined as the level of fit between an extended brand and the general imagery of the parent brand. Exemplar fit is defined as the level of fit of the extended brand's existing product of with the parent brand.

Park, Milberg, and Lawson (1991), Mao and Krishnan(2006), and Bhat and Reddy (2001) all saw the need to differentiate multiple dimensions of extension fit. They were not, however, able to agree on a conclusive definition. Therefore, this study attempts to clear up the confusion while putting forward definitions of objective and subjective fits. My definitions of subjective and objective fit most closely follow those of Bhat and Reddy (2001). I define objective fit as the consumers' perceptions of the similarity of the product categories of the

parent and extended brand; subjective fit refers to the consumers' perceptions of the similarity between the image of the extended brand and the parent brand.

Because of its importance to the success of brand extension, fit has emerged as a critically important research topic. Nonetheless, research is limited on the relevant importance of subjective and objective fit. Starbucks, the coffeehouse chain based in Seattle, Washington, is expanding their brand by introducing to some of their stores food such as sandwich and lasagna. Food and coffee may belong to similar categories, enjoying a high objective fit. However, ready-to-go instant food may clash with Starbucks' premium image in consumer's mind, potentially creating a low subjective fit. Sometimes an extended brand can be similar in both subjective and objective fit while other brands, such as Starbucks in this case, have a similar objective fit but a dissimilar subjective fit. The relative importance of these two fits is still unknown. Therefore, I seek to find which particular criteria of the fit, subjective or objective, has a greater impact on consumer decisions when choosing a brand-extended product.

2.2 Risk

When purchasing a product there are risks involved; the product might not work properly; the product could turn out to be something different than the consumer expected; the purchase could cast an unflattering light on the consumer social status, and/or performance of the product might turn out to be disappointing given the price paid. Perceived risk is an imperative factor that moderates the impact of coherence on brand or product evaluation (Campbell & Goodstein, 2001). Consumers seek to reduce the risk by purchasing products

from established or extended brands. Purchasing a product from an extended brand may minimize the level of risks, but it does not entirely eliminate them. DelVecchio & Smith (2005) claimed that brand extension price premiums are accepted because they reduce the perceived risk consumers feel when purchasing a new product. Milberg, Sinn, & Goodstein (2010) researched risk in association with competitive and noncompetitive settings of brand extension. These authors proposed that perceived risk mediates the influence of fit in noncompetitive settings and competitor brand familiarity in competitive settings. In non-competitive settings, the relationship between fit and evaluations are at least partially mediated by risk. DelVecchio & Smith (2005) found a positive relation of perceived fit between brand extension price premium and perceived fit, which was moderated by the level of risks. This study uses three types of risks identified in the DelVecchio & Smith (2005) study: financial, category, and social. Financial risk is the economic expenses that may accrue if a product does not perform appropriately; performance risk refers to losses associated with the product's failure to meet consumer's performance expectations; and social risk is the risk consumers face that their peers could evaluate them skeptically due to their purchase of a product (DelVecchio & Smith, 2005).

2.3 Knowledge

There is little research on the effect of expertise on consumer reason for choice. However, it is plausible to suspect that consumer reason for choice varies according to expertise. For example, consumers with little expertise on

cell phone categories may simply choose cell phones based on the popularity of brand, design, or other cursory attributes. On the other hand, consumers with high expertise may analyze each feature and tech specs. Past studies have found that low-familiar and high-familiar consumers tend to perceive better price-quality relationship than do moderately familiar consumers. Low-familiar consumers are more likely to adopt extrinsic information based on their belief; high familiar consumers are more likely to accept knowledge that a quality extrinsic cue association exists in the market (Rao & Monroe, 1988). Mitchell and Dacin (1996) found that consumers with increased levels knowledge made more conjectures about performance attributes from physical-attribute information when choosing between alternatives. Therefore, I suspect that both about parent brand and extended category is a necessary area to study in relation to brand extension success.

Traditionally, knowledge has been considered a one-dimensional construct. Most often, researchers in referring to prior knowledge have used, interchangeably, the terms familiarity (Ha & Perks, 2005; Park & Lessig, 1981, Rao & Monroe, 1988), expertise (Mitchell & Dacin, 1996), and experience. Alba & Hutchinson (1987) suggested that consumer knowledge be composed of two major components: familiarity and expertise. Familiarity is defined as the number of product-related experiences that a consumer has compiled. Expertise is the ability to perform product-related tasks appropriately (Alba & Hutchinson, 1987). Product-related tasks include advertising exposure, interactions with sales associate, product purchase, information search, decision making and product usage in different settings. Expertise concerns a much

deeper meaning than knowledge. An increase in familiarity results in an increase in expertise with a particular product, brand, or category. In our brand extension research, I study consumer knowledge in two different dimensions: parent brand knowledge and category knowledge.

2.4 Confidence

Consumer expertise is seldom thorough or errorless. Confidence has often been studied in relation to knowledge in the context of decision making (Carlson et al., 2009; Park & Lessig, 1981; Brucks, 1985; Park et al., 1994). Park & Lessig (1981) proposed that confidence in utilizing brand name is a function of consumer, decision maker, and familiarity. They find confidence increases monotonically with the level of familiarity. After having written an inclusive paper on consumer expertise (1987), Alba & Hutchinson (2000) wrote another one on consumer knowledge as it related to accuracy, calibration, and confidence. The authors find that confidence is dependent on consumer expertise, as well as other factors such as experience. The level of confidence consumers hold in their beliefs, knowledge, and predictions will impact the propriety of the actions consumers take. Moorman (1991) found similar results, observing that self-assessed knowledge and actual knowledge were weakly related and that information search was inversely related to self-assessed knowledge.

Confidence levels can be indicated by measures of subjective knowledge (Brucks, 1985). A recurring problem is knowing how to distinguish subjective knowledge from confidence, a problem investigated by Carlson et al

(2009). Subjective knowledge reflects one's perceived level of knowledge whereas confidence is how confident the individual is with respect to the accuracy of judgments or decisions. As seen through many studies, confidence is a necessary topic to be considered along with expertise in studying brand fit impact on brand extension. So far I have reviewed brand fit, risk, knowledge, and confidence under brand extension. In the next section, I lay out my research method and then the model used in this study.

3. Method

3. 1 Measure of Variables

Our main variable of interest is the subjective and objective fit. I simply follow the definition of subjective fit (SUB) by asking the fit of brand image between the parent and the extended brand. Aaker & Keller (1990) addressed the importance of dimensions of fit such as abstract attributes, complementarity, substitutability, and others. Nonetheless, all other studies on brand fit use different measures. For measures of objective fit (OBJ) Aaker & Keller's (1990) measures are implemented. In their study, three fit measures are used to measure categories. These three measures are complement, substitute, and transfer. Complement indicates the degree to which consumers view two product categories as complements. Substitute is the degree to which consumers view two product categories as substitutes. Transfer measures how consumers view relationships in product manufacturing. Of these three dimensions of objective fit, substitute turned out to be not as important as transfer and complement. Therefore, I use complement (COMP) and transfer (TRAN) as our measures of objective fit.

Following Alba & Hunchinson (1987), I measure knowledge in two dimensions, familiarity and expertise. Alba & Hunchinson (1987) argued that consumers with high expertise process information about different brands in greater depth than consumers with low expertise. Mitchell & Dacin (1996) also argued that consumers with high expertise also have greater attribute-performance knowledge, and should also have greater ability to compare the

attributes between in-product class than just indicate whether an object involves that attribute or not. Therefore, I measure expertise by asking the level of pros and cons of using a particular category, for extended category expertise and parent brand, for parent brand expertise and directly measure consumer's familiarity.

Self-confidence involves a subject's confidence with respect to a decision made. I measure it directly by asking a consumer's level of confidence in expertise. For all our dependent variables of familiarity (FAM), expertise (EXP), confidence (CONF), and preference (PREF), I measure within the dimension of both the extended category (represented with a "C" in front of the variable) and the parent brand (represented with a "B" in front of the variable)

I use surveying methods to obtain the data on brand extension and importance of fit for brand extension success. With measures developed in the previous section, I use existing brand but hypothetical extensions to control for exposure effect. Past research suggests that repeated exposure to an extended product may raise consumers' perceptions of fit. Greater exposure to the extended brand facilitates consumers to in identifying more shared attributes between the parent brand and the extended brand.

3.2 Pretest

A pretest was conducted on 168 subjects to test the moderating effects of knowledge, confidence, and the three types of risk and to select brands and the extension at various levels of brand fit. These subjects were asked to answer questions on subjective and objective fit of 12 brands and 8 extension

categories and finally asked to choose multiple brand extensions they thought they were likely to purchase. The original brands were selected with the criteria of being relevant and well known to all subjects, generally perceived as being of high quality, composed of local and global brands, and not broadly extended previously. These brands identified were Apple, Aveda, McDonalds, Haagen Daz, 3M, Incase, BYC, Kraze Burger, Morning Glory, Pulmuone, Missha, and SM Entertainment. The first five brands are global brands and the second five are local Korean brands. Based on the selected brands, eight categories that none of the selected brands had been entered into were identified to be used in the pretest. These categories were headphones, chocolates, movie theaters, toothpaste, beer, sunglasses, digital cameras, and sportswear.

Of the 168 that started the survey, only 82 subjects completed the survey. From these 82, I was able to find 4 brands and identify 2 high fit categories and 2 low fit categories, which added up to 16 brand extensions. The brands selected were Apple, McDonalds, Missha, Pulmuone; the categories selected were headphones, chocolates, movie theatres, and toothpaste. Using these 16 extensions of brands and categories, I collected consumers' perception of the extension as well as their knowledge of brands and categories, as can be found in Appendix 1.

3.3 Main Test

Subjects consisted of 200 university students. They were assigned to evaluate either Apple or Missha extending to four categories, or Pulmuone and McDonalds extending to four categories. There was a combination of 16 possible brand extensions in total and subjects were randomly assigned to each of two sets. Subjects ended up answering 4 different extensions, which added up to 800 data points for all 16 different extensions. The survey is provided in the Appendix.

4. Estimation

4.1 Multivariate Adaptive Regression Splines (MARS)

To flexibly model the high dimensional data, I follow Friendman's (1991) approach, the multivariate adaptive regression splines (MARS). The form of the model is expansion in product spline basis functions, where the data automatically determines the number of basis functions and the parameters associated with each one, such as product degree and knot locations. The MARS method generates a continuous model with continuous derivatives and has the capability and flexibility to model relationships that are additive or have interactions. Furthermore, MARS can also be described in a form that singly identifies the additive effects and those associated with the different multivariable interactions. The MARS model perfectly suits my objective to find significant variables that influence brand fit, as well as to find the optimal level of objective and subjective fit using the estimated model. The MARS model adequately approximates a function of many variables, given only the value of the function at various points among dependent variables (Friedman, 1991).

The success of brand extension is presumed to be described by

(1) $$\mathrm{INTEN} = \mathrm{f}(\mathrm{SUB}, \mathrm{OBJ}, \mathrm{PRISK}, \mathrm{SRISK}, \mathrm{FRISK}, \mathrm{CFAM}, \mathrm{CEXP}, \mathrm{CCONF}, \mathrm{BFAM}, \mathrm{BEXP}, \mathrm{BCONF}) + \varepsilon$$

The function is defined over some domain

$$(\mathrm{SUB}, \mathrm{OBJ}, \mathrm{PRISK}, \mathrm{SRISK}, \mathrm{FRISK}, \mathrm{CFAM},$$

$$\text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) \in \text{D} \subset \text{R}^{11}.$$

The deterministic function f, Equation (1), captures the joint predictive relationship of purchase intention (INTEN) on subjective fit (SUB), objective fit (OBJ), performance risk (PRISK), social risk (SRISK), financial risk (FRISK), category familiarity (CFAM), parent brand familiarity (PFAM), category expertise (CEXP), parent brand expertise (PEXP), category preference (CPREF), and brand preference (BPREF). ε is the additive stochastic component with the expected value defined as zero. Moreover, ε reflects the dependence of brand extension success on perceptions other than dependent variables that are neither controlled nor observed. The purpose of this regression analysis uses the data to construct a function f to perform as an acceptable approximation to f(SUB, …, BCONF) over the domain D of interest.

The objective here is to see how each variables influence subjective and objective fit and how subjective and objective fit influence the purchasing intention of a child brand and how the effects differ relative to the other type of fit. Therefore, I run simultaneous equations model where function of intention, subjective and objective fit are estimated simultaneously:

(2) $$\text{INTEN} = \text{f}(\text{SUB}, \text{OBJ}) + \varepsilon_1$$

$$\text{SUB} = \text{f}(\text{PRISK}, \text{SRISK}, \text{FRISK}, \text{CFAM}, \text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) + \varepsilon_2$$

$$\text{OBJ} = \text{f}(\text{PRISK}, \text{SRISK}, \text{FRISK}, \text{CFAM}, \text{CEXP}, \text{CCONF}, \text{BFAM}, \text{BEXP}, \text{BCONF}) + \varepsilon_3)$$

where ε_1 , $\varepsilon_2, \varepsilon_3$ is the additive stochastic component with the expected value defined as zero. I separately run Equation (1) and (2) for these two models and explain their results.

4.2 Results

In Equation (1), I first estimate the impact of the subjective fit (SUB) and objective fit (OBJ) interaction with other variables of our interest on purchase intention. I include brand and category-specific dummy variables to see if consumer decisions varied under any specific brand and category combination.

I find that for subjective fit below 6, purchase intention decreases by -0.18381 and that for objective fit above 1.5, purchase intention increases by 0.22094. Category expertise, CEXP, also has a significant main effect; category expertise below 2 decreases purchase intention by -0.38074; category expertise above 2 decreases purchase intention by -0.18121. Performance risk is one of the factors consumers are conscious about. No matter how high the perceived subjective fit is, if perceived performance is moderate, or high, consumer's purchase intention decreases by -1.36997, more than any other effects captured.

Table 2. Estimates Results with Covariates

	Estimate	Std. Error	
Intercept	3.03803	0.29302	***
max(0, 6-SUB)	-0.18381	0.06734	**
max(0, OBJ-1.5)	0.22094	0.0677	**
max(0, CEXP-2)	-0.18121	0.05333	***
max(0, 2-CEXP)	-0.38074	0.15846	*
max(0, CEXP-2) * max(0, FRISK-5)	-0.11459	0.03253	***

max(0, CEXP-2) * max(0, 5-FRISK)	-0.05114	0.01436	***
max(0, PRISK-3) * max(0, 6-SUB)	-0.05118	0.01007	***
max(0, 3-PRISK) * max(0, 6-SUB)	-0.11248	0.02736	***
max(0, 6-PFAM) * max(0, OBJ-1.5)	-0.06954	0.01663	***
max(0, SRISK-6) * max(0, 6-SUB)	0.06855	0.02701	*
max(0, 6-SRISK) * max(0, 6-SUB)	0.06011	0.01086	***
max(0, CEXP-2) * max(0, SUB-2)	0.08849	0.02101	***
max(0, CEXP-2) * max(0, 2-SUB)	0.19669	0.05228	***
max(0, CCONF-3) * max(0, OBJ-1.5)	0.07015	0.01847	***
max(0, 3-CCONF) * max(0, OBJ-1.5)	0.19817	0.07293	**
max(0, PRISK-2) * max(0, SUB-6)	-1.36997	0.39747	***
max(0, PCONF-4) * max(0, OBJ-1.5)	0.08215	0.02901	**
C1″	0.33153	0.11523	**
C2	0.22	0.11419	.
C3	0.13258	0.11718	
B1	0.13312	0.12869	
B2	0.0985	0.12515	
B3	0.04843	0.12198	

Note: Headphone: (C1, C2, C3)=(0,0,0); Movie Theater: (C1, C2, C3)=(1,0,0); Toothpaste: (C1, C2, C3)=(0,1,0); Chocolate: (C1, C2, C3)=(0,0,1)

Note: Apple: (B1, B2, B3)=(0,0,0); Pulmuone: (B1, B2, B3)= (1,0,0); Missha: (B1, B2, B3)=(0,1,0); McDonalds: (B1, B2, B3)=(0,0,1);

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 2 shows that the estimation of covariates is not significant except in two categories, movie theaters and toothpaste, which showed significance at 0.1 and 0.05 levels. Since these covariates showed significance at low levels, I conclude that the covariates have no effect on the model and that all categories and brand extension combinations are not different from that of baseline category and brand. Therefore, I do not include the covariates when running Equation (2) and for any other models after.

Significant variables and estimation values from the simultaneous equation model, Equation (2), are shown in Table 3. Except for category expertise, I find significant effects for all the variables. Although most variables have a similar effect on both subjective and objective fits, almost all variables have slightly greater, through minor effect on subjective fit.

Table 3. Simultaneous Equations Model Estimation

	SUB			OBJ		
Variable	Estimate	Std. Error		Estimate	Std. Error	
Intercept	3.212115	0.205735	***	3.332453	0.211797	***
max(0, 6-SRISK)	0.513452	0.037128	***	0.43107	0.038222	***
max(0, PRISK-2)	-0.30017	0.036267	***	-0.34713	0.037335	***
max(0, 2-PRISK)	-0.86526	0.208331	***	-0.96621	0.21447	***
max(0, PEXP-6)	-0.81773	0.300835	**	-1.20699	0.3097	***
max(0, 6-PEXP)	-0.19818	0.033271	***	-0.20448	0.034252	***
max(0, CCONF-6)	0.387432	0.193164	*	0.443995	0.198856	*
max(0, 6-CCONF)	-0.14611	0.037344	***	-0.1344	0.038444	***
max(0, CFAM-3)	-0.0718	0.029807	*	-0.07565	0.030685	*
max(0, PCONF-4)	0.19486	0.076663	*	0.26427	0.078921	***
max(0, FRISK-3)	0.355165	0.063483	***	0.360392	0.065353	***
max(0, PFAM-5)	-0.209	0.072657	**	-0.17199	0.074798	*
max(0, FRISK-5)	-0.59571	0.137287	***	-0.59559	0.141332	***

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

	INTENT		
Variable	Estimate	Std. Error	
Intercept	4.857152	0.123743	***
max(0, SUB-6)	0.726441	0.348691	*
max(0, 6-SUB)	-0.29095	0.0569	***
max(0, 6.5-OBJ)	-0.31185	0.056578	***

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

With subjective fit above 6, purchase intention increases by 0.726. For subjective fit below 6 and objective fit below 6.5, purchase intention decrease by -0.29095 and 0.31185, respectively. Low levels of objective fit would decrease the purchase intention by 0.31885 but a high level of objective fit has no effect on purchase intention. Results show how subjective and objective fit changes with respect to three risks and category and parent brand preference, confidence, and expertise. Since I am interested in how the subjective and objective brand fit is moderated by covariates, I estimate another model where the main effects are only allowed for subjective and objective fit while other covariates are allowed to enter as interaction terms only.

Here I introduce other covariates: category preference (CPREF) and parent brand preference (PPREF). I am not interested in these covariates but it is introduced to see any possible effect in relation to other variables. Second degree interaction is found to have the best BIC value of 2782 and the results are as below:

Table 4. Estimation with Interaction in Covariates

Variable	Estimate	Std. Error	
Intercept	3.142951	0.227366	***
max(0, SUB-6)	2.251613	0.618689	***
max(0, 6-SUB)	-0.1444	0.05737	*
max(0, OBJ-1.5)	0.163205	0.062059	**
max(0, PRISK-3) * max (0, 6-SUB)	-0.05048	0.009388	***
max(0, 3-PRISK) * max(0, 6-SUB)	-0.09274	0.025286	***
max(0, 6-SRISK) * max(0, 6-SUB)	0.046145	0.009514	***
max(0, PCONF-5) * max(0, PPREF-6)	1.857898	0.282888	***
max(0, 5-PCONF) * max(0, PPREF-6)	1.649505	0.597844	**
max(0, CEXP-2) * max(0, PPREF-6)	-0.59803	0.180976	***

max(0, 2-CEXP) * max(0, PPREF-6)	-2.97547	0.706083	***
max(0, OBJ-1.5) * max(0, 3-CPREF)	-0.24949	0.052466	***
max(0, PEXP-2) * max(0, 6-SUB)	-0.02602	0.007979	**
max(0, 3-PFAM) * max(0, 6-PPREF)	-0.11683	0.020844	***
max(0, CCONF-3) * max(0, OBJ-1.5)	0.09578	0.020233	***
max(0, 3-CCONF) * max(0, OBJ-1.5)	0.253273	0.070611	***
max(0, PCONF-5) * max(0, SUB-6)	-1.58093	0.477577	***
max(0, 5-PCONF) * max(0, SUB-6)	-1.06045	0.252014	***
max(0, PEXP-5) * max(0, PPREF-6)	0.825484	0.273711	**
max(0, 5-PEXP) * max(0, PPREF-6)	2.544904	0.777181	**

Note: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

MARS finds three main effect splines of subjective fit greater than 6, subjective fit less than 6 and objective fit greater than 1.5 Subjective fit greater than 6 increases purchase intention by 2.251613 which is larger than any other main effects. Subjective fit less than 6, on the other hand, decreases purchase intention by -0.1444. Objective fit greater than 1.5 increases purchase intention by 0.163205. These three splines capture large effects while other interaction effects are relatively marginal. Interestingly, financial risk and category familiarity nodes are not captured in this analysis.

5. Simulation

5.1 Single Variable Simulation

To show how few variables of interest influence purchase intention, all other variables should be controlled. I use a simulation method to be able to control for variables outside my interest. The detailed simulation procedure is as follows:

Step 1. Since each variable is measured on a 7 point Likert scale, I divide each scale into 10 discrete points to be able to capture effects at small points. Therefore, I generate 70 points from 0.1 to 7 for each variable of interest and these points are listed in lexicographical order. For example, I am interested in capturing effect of performance risk on intention through subjective fit, so I generate 70 points for performance risk and 70 points on subjective fit. These 70 points in combination will produce 4900 discrete points on which the effect of performance intention could be mapped.

Step 2. Values of other variables are randomly generated and for each of 4900 discrete points. For variables not of interest, 1,000 values are randomly generated.

Step 3. For one discrete point, 1,000 generated values are plugged into the estimated model. There are 1,000 results and these are averaged. The average is the controlled effect of other variables not of interest.

Step 4. Repeat the procedure for all 4,900 points.

Using a simulation method, I find each covariate impact on purchase intention through subjective fit, (see Figure 1), which is compared with covariate impact on purchase intention through objective fit, (Figure 2).

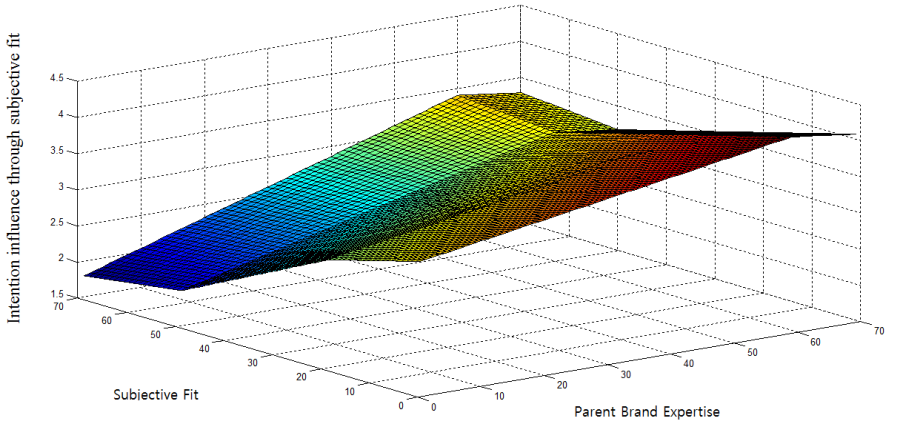


Figure 1. Impact of Parent Brand Expertise and Subjective Fit on Purchase Intention

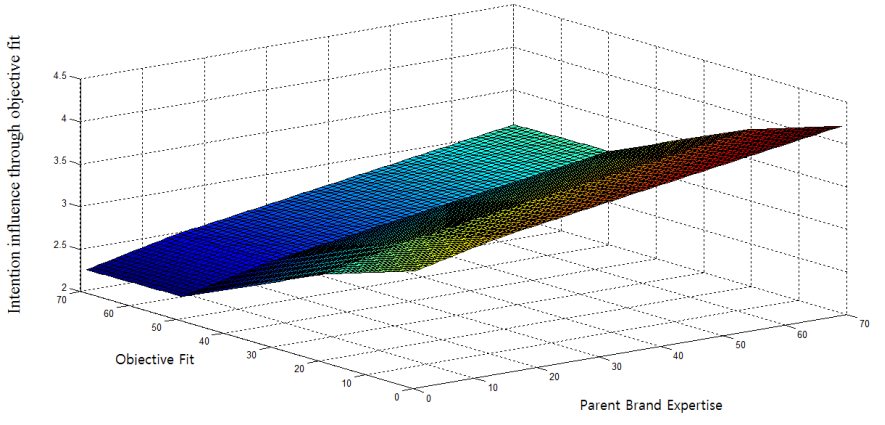


Figure 2. Impact of Parent Brand Expertise and Objective Fit on Purchase Intention

From Figures 1 and 2, purchase intention for each parent brand expertise point was averaged. Using these averaged purchase intentions, Figure 3 shows the parent brand expertise (PBEXP) impact on purchase intention through objective and subjective fits compared on the same axis. I find that when parent brand expertise is below 3.254, objective fit has a higher impact on purchase intention than does subjective fit. When parent brand expertise is above 3.254, subjective fit increases purchase intention more than does objective fit does. The cutoff point is 3.254, where the subjective fit and objective fit impose the same purchase intention.

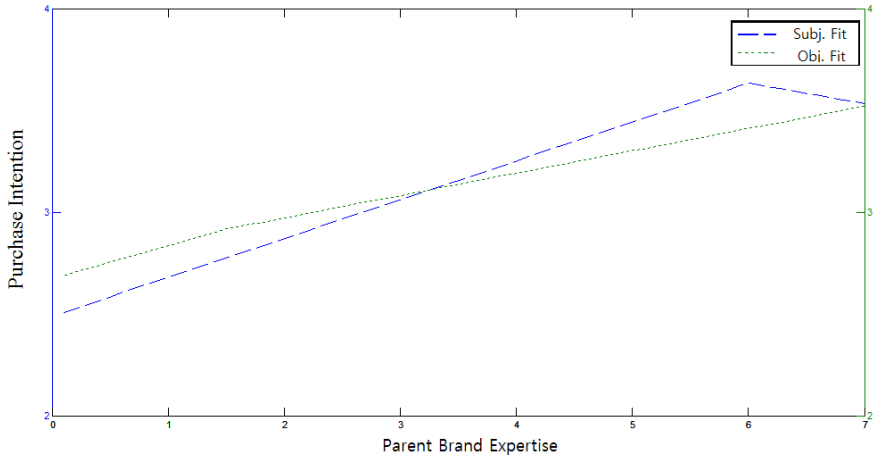


Figure 3. Purchase Intention Change with Change in Parent Brand Expertise

Figure 2 shows the difference in purchase intention for subjective and objective fits when variables other than parent brand expertise are controlled. When the parent brand expertise is greater than the cutoff point, 3.254, the subjective fit has greater impact on purchase intention and this difference reaches maximum when parent brand expertise is 6.

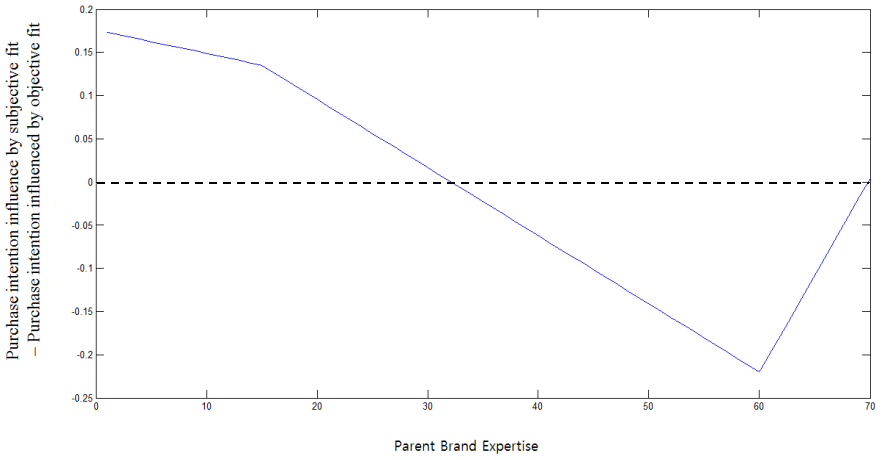


Figure 4. Difference of Purchase Intention Change with Change in Parent Brand Expertise with Respect to Subjective Fit and Objective Fit

So far I have evaluated purchase intention change with respect to parent brand expertise only. Cutoff points for all other covariates are provided in Table 5.

Table 5. Cutoff Points for all Covariates

Variable	Cutoff Point	If X>Cutoff
Category Expertise	3.231	Subjective fit > Objective Fit
Category Confidence	3.306	Subjective fit > Objective Fit
Parent Brand Familiarity	3.338	Subjective fit > Objective Fit
Parent Brand Expertise	3.254	Subjective fit > Objective Fit
Parent Brand Confidence	3.429	Subjective fit > Objective Fit
Social Risk	3.402	Subjective fit > Objective Fit
Performance Risk	3.228	Subjective fit > Objective Fit

Cutoff Point: When intention through subjective fit = intention through objective fit

It is important to note that I find cutoff points for all variables at relatively similar places. For instance, the cutoff point for category expertise is 3.231 and the cutoff point for parent brand familiarity is 3.338. Cutoff points

for all variables are similar because main effect is significantly large and these variables are not captured as the main effects. Cutoff points are shifted only through marginal interaction effects and therefore cutoff points are relatively similar for all variables.

5.2 Bootstrap

Although the simulated results show that change in purchase intention through subjective and objective fit differ, it does not tell us whether their difference is significant. Hence, I use bootstrapping methods to test,

Ho: Intention through objective fit – Intention through Subjective fit =0.

Using bootstrapping methods, error band for the difference in intention is developed at a 95% confidence level.

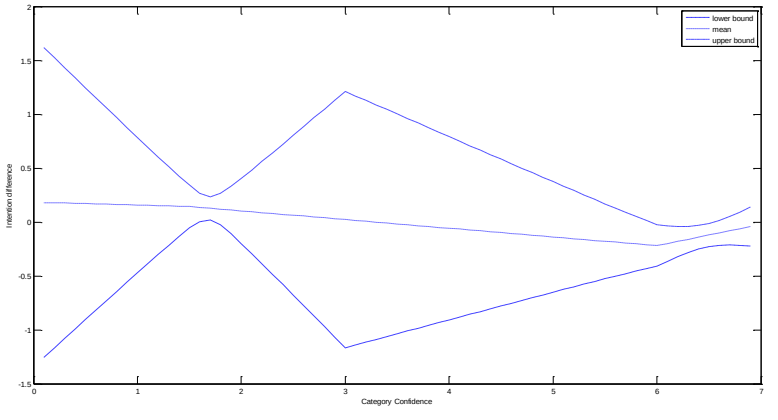
Table 6. Insignificant Region for Ho

Variable	Ho*Insignificant Region
Category Expertise	None
Category Confidence	1.6-1.7
Parent Brand Familiarity	None
Parent Brand Expertise	0.1-2.0
Parent Brand Confidence	None
Social Risk	1.5-2.2
Performance Risk	None

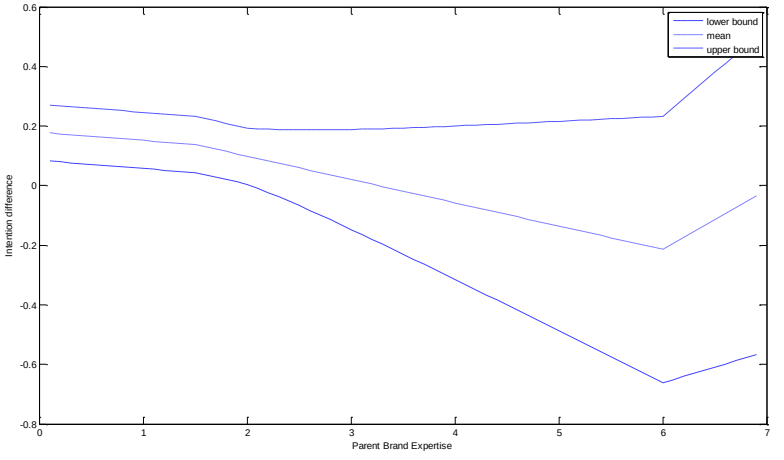
*Ho: Intention through objective fit - Intention through subjective fit =0

Error bands that include 0 at all regions mean that the null is significant and that there is no difference between the purchase intention through objective fit and subjective fit. The null hypothesis for category expertise, parent brand familiarity, parent brand confidence, and performance risk are not rejected and are significant at all regions of the variable. However, category confidence, parent brand expertise and social risk have significant null at particular regions noted in Table 6. Graph 5 displays the error bands for three variables with insignificant null at a particular region.

(a) Category Confidence



(b) Parent Brand Expertise



(c) Social Risk

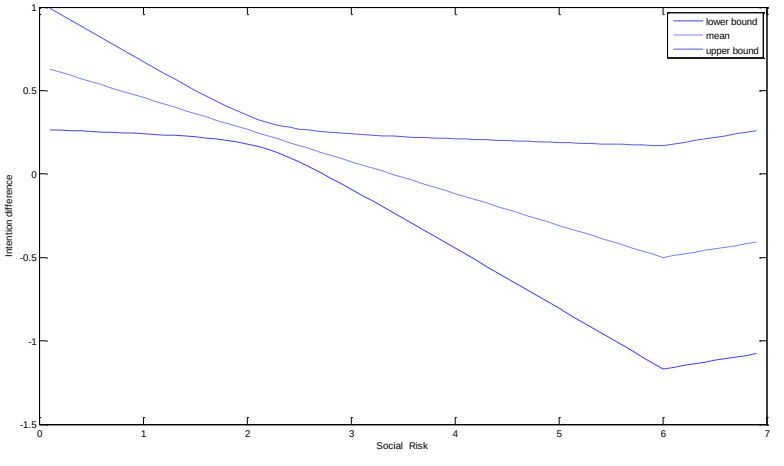


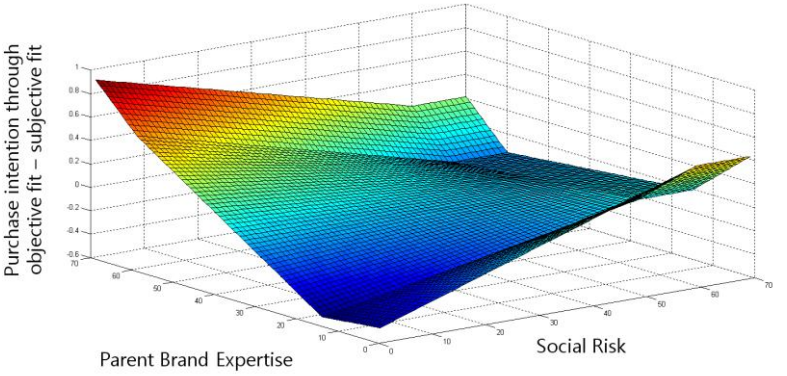
Figure 5. Error Band for Variables with Insignificant Regions for Ho

5.3 Double Variable Simulation

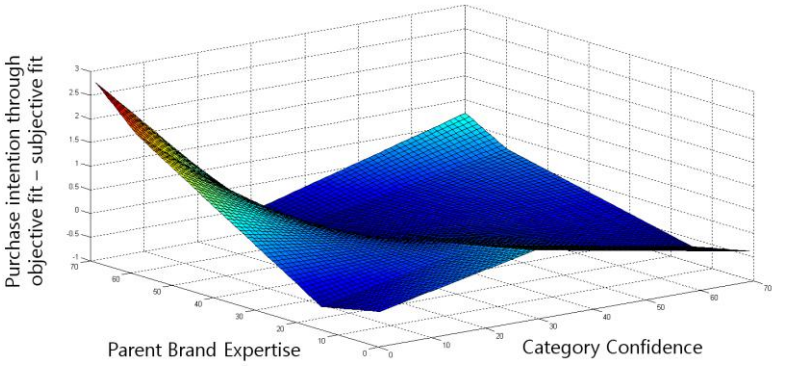
To map two covariates affecting purchase intention at the same time, I use three variables- parent brand expertise, category confidence, and social risk- with different perceived levels of purchase intention through subjective and

objective fit. To find the impact of two covariates on purchase intention through subjective and objective fit, I use the same simulation method but insert another set of 70 generated points to our 4900 points, totaling 343000 points. I control for other variables and map pairs, parent brand expertise vs. social risk, social risk vs. category confidence, and parent brand expertise vs. category confidence, influence on purchase intention through subjective fit and objective fit. The difference of purchase intention generated through objective fit and subjective fit is shown in Figure 6. Since the paper's main interest is to configure when purchase intention through subjective fit is higher than objective fit or vice versa, I generate 2-dimentional graphs showing regions with higher purchase intention through subjective fit or objective fit.

(a) Social Risk vs. Parent Brand Expertise



(b) Category Confidence vs. Parent Brand Expertise



(c) Category Confidence vs. Social Risk

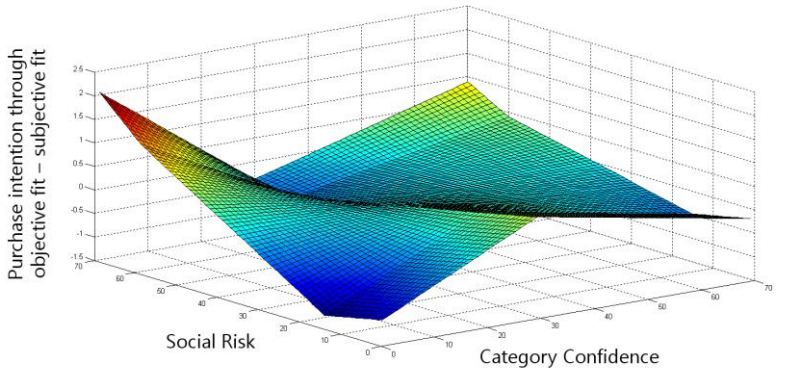
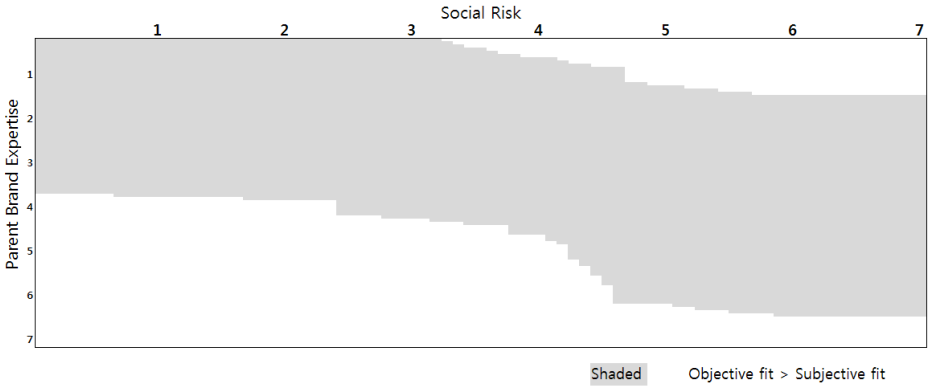
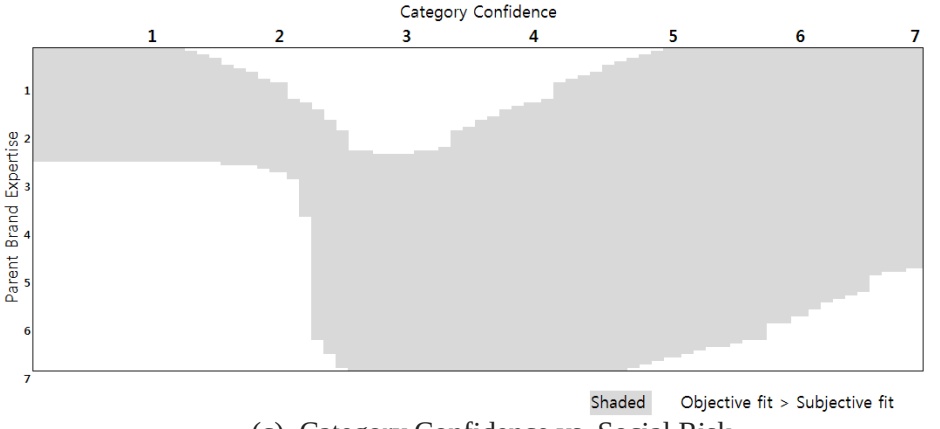


Figure 6. Difference of Purchase Intention Generated through Objective fit and Subjective Fit for Parent Brand Expertise vs. Social Risk, Social Risk vs. Category Confidence, and Parent Brand Expertise vs. Category Confidence

(a) Social Risk vs. Parent Brand Expertise



(b) Category Confidence vs. Parent Brand Expertise



(c) Category Confidence vs. Social Risk

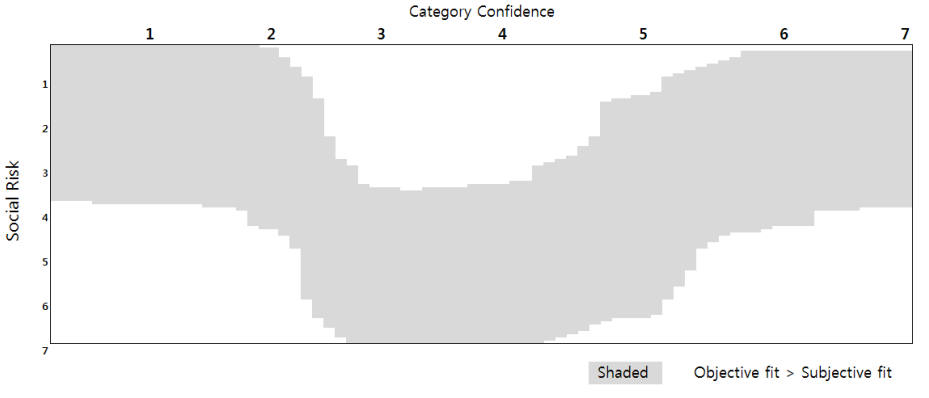


Figure 7.Color Graph of Extent of Purchase Intention Generated Through Subjective Fit or Objective Fit

Figure 7 shows that there are clearly interactions between parent brand expertise vs. social risk, social risk vs. category confidence, and parent brand expertise vs. category confidence. In Figure 7, when perceptions of any two variables are both high, consumers generate more purchase intention through subjective fit than objective fit. On the other hand, when perceptions of any two variables are both low, consumers generate more purchase intention through objective fit than subjective fit. This result corresponds with the result from Figure 3, which show that consumers generate more purchase intention through subjective fit than objective fit for any single variable when their perception of the variable is high. Greater subjective fit at high perception, for any single varying variable explains why, in Figure 7, the purchase intention generated through subjective fit is greater than objective at right hand corners (i.e., high perception for both variables) in Figure 7. Similarly, when perception of a variable is low, consumers generate more purchase intention through objective fit than subjective fit.

When consumers lack extensive expertise of a brand, they are left with only category information of the product to decide whether to buy the new product or not. Therefore, when consumers perceive little much social risk, or have low confidence about their expertise of the category, consumers are more likely to use category similarity to serve as a measure of high quality. Hence, consumers are likely to perceive greater purchase intention through objective fit than subjective fit.

At high levels of parent brand expertise and low levels of social risk or category confidence, consumers generate purchase intention through subjective

fit. Since consumers have extensive expertise with brand, they use as a cue to purchase the new product, the similarity of brand information between the parent and the extended brand.

When the social consequences of purchasing a product (i.e., social risk) are very high for a consumer but their confidence of the category expertise is low, consumers rely, when purchasing a new product, on how the product is visibly branded. Therefore, subjective fit generates greater purchase intention than objective fit at high levels of social risk and low levels of category confidence. Similarly, when social risk is high and parent brand expertise is very low, consumers rely on written and pictorial product descriptions of the product (DelViccio, 2009). Therefore purchase intention generated through subjective fit is greater and that of objective fit.

At high levels of both social risk and category confidence, consumers are already confident about the category that the new product is in but sense great risk about it being vulnerable to peer evaluation. Therefore, consumers prefer a visibly branded product and in using a criterion to purchase the new product are left with the similarity of the brand. To generate purchase intention, consumers rely on subjective fit. On the other hand, when social risk is low, consumers have no incentive to prefer a visibly branded product but they are highly confident of their expertise about the category. Therefore, for purchase intention, they rely on objective fit. Similarly, with a high level of category confidence and a low level of parent brand expertise, consumers naturally generate more purchase intention through the criterion they know best.

Therefore, purchase intention generated through objective fit is higher than subjective fit.

At mid to high levels of category confidence, consumers are more likely to depend on category fit to evaluate their purchase intention unless consumers have exceptionally high parent brand expertise.

When consumers have at least minimal confidence in the category (i.e., moderate category confidence), it depends on the level of social risk whether greater purchase intention is generated through objective fit or subjective fit. At high levels of social risk, consumers will have greater purchase intention when the category of the new product is similar to the existing product (i.e., objective fit). At lower levels of social risk, consumers face little risk in their decision making. Therefore, they have little incentive to rely on objective fit because they do not have much confidence about their expertise of category. Therefore, consumers are more likely to generate purchase intention through subjective fit than objective fit.

6. Conclusion

This study has shed light on the factors that may affect brand extension success by influencing subjective and objective brand fit. I estimate three models: 1) covariates' (including category- and brand-specific dummy variable) impact on purchase intention, 2) simultaneous equation model of subjective fit, objective fit, and purchase intention, and 3) covariates' impact on purchase intention (interaction only allowed for brand fit variables). Simulation methods are used to find particular variables' solo effect on brand fit, therefore influencing purchase intention.

This study has shown, through our simultaneous equations model, that consumers weigh objective fit more heavily than subjective fit. This result also aligns with the fact that performance risk had the strongest influence on purchase intention. Since consumers are quite conscious about performance risk, it is natural that they would refrain from purchasing brand extensions that are in a totally new category from that of the parent brand. Therefore, managers should try to brand extend to an appropriate category. Nevertheless, subjective fit is still an important factor and it should also be carefully considered.

The simulation study also showed how subjective and objective fits are moderated through covariates. Since the model did not allow for a main effect of covariates, the result showed little variation effect from all of the covariates. Therefore, a future study should allow for the main effect of the covariate.

Another limitation of the study is that I was unable to measure subjective fit in a multidimensional construct. A future study should refine the

definition of subjective fit and try finding any constructs that could be seen as a subjective fit between a parent and child brand.

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Appendix: Measurement Scales

Part 1: Measure of fit

Subjective Fi

Q: How much do you think the image of Apple coincide with the image of following brand?

Q: How much do you think the new product will strengthen the image of Apple?

Objective Fit

Complement

Q: Can two products be jointly consumed to satisfy some particular need?

Transfer

Q: Do you feel that the people, facilities, and skills a firm uses to make the original product would transfer and be employed effectively in designing and making the product extension?

Part 2: Measure of Extension Success

Q: How likely are you to purchase the product?

Q: What is your preference of following brand?

Q: What is your preference of following category?

Part3: Measures of Risk

Performance Risk

Q: If you buy the following product, how likely are you to have problems with the performance?

Social Risk

Q: If you buy the following product, do you think other people are likely to negatively evaluate your purchase?

Financial Risk

Q: If you buy the following product, how likely are you to regret purchasing it given the financial commitment?

Part4: Measures of Knowledge and Confidence

Brand

Familiarity

Q: How familiar are you with the given brand?

Expertise

Q: How likely are you to know about pros and cons of using following brand compared to other similar brands?

Confidence

Q: How confident are you with your judgment of knowing pros and cons of using the following brand?

Category

Familiarity

Q: How familiar are you with the given category?

Expertise

Q: How much pros and cons do you know about this product/service over other substitutable products or services?

Confidence

Q: How confident are you about your judgment of knowing pros and cons of the following product?

국 문 초 록

특정 브랜드가 새로운 상품군에서 새로운 브랜드로 확장하는 경우, 두 브랜드의 브랜드 적합성 (brand fit)에 따라 성공여부가 달라질 수 있다. 기존의 많은 연구들이 브랜드 적합성이 브랜드 확장에 어떠한 영향을 주는지 연구해 왔으나, 소수의 연구만이 브랜드 적합성을 구체적으로 세분화 시켰다.

일반적으로 브랜드 적합성은 크게 모 브랜드와 자 브랜드의 이미지 적합성을 고려한 주관적 적합성 (subjective fit)과 카테고리 적합성을 고려한 객관적 적합성 (objective fit) 으로 나누어 지는데, 성공적인 브랜드 확장을 위한 각 적합성의 상대적 정도를 비교한 연구는 많지 않았다. 본 연구에서는 브랜드 확장시, 고객이 인지하는 위험도(risk)에 따라 객관적 적합성과 주관적 적합성의 상대적인 중요도가 어떻게 달라지는지를 살펴 본다.

DelVecchio and Smith (2005) 에 다르면, 위험도는 성능적 위험 (performance risk), 금전적 위험 (financial risk) 그리고 사회적 위험 (social risk)등으로 나뉘는데 이 위험도들은 상품군 또는 브랜드에 대한 고객의 지식(knowledge)에 따라 달라진다.

고객의 지식은 친근도 (familiarity)와 전문성 (expertise)으로 나뉘며, 이 중 전문성은 신뢰도 (confidence)와 근접한 영향이 있다고 Carlson et al.,(2009), Park and Lessig (1981), Brucks (1985), 그리고 Park et al., (1994) 등의 논문에서 언급되었다. 본 연구에서는 이러한 친근도, 전문성, 그리고 신뢰도를 각각의 브랜드에 대해, 상품군에 대해 나누어 측정하였다. 좀 더 구체적으로는, 설문 방법을 이용하여 4 개의 다른 브랜드가 4 개의 다른 상품군 안에 확장 했을 때 고객의 선택여부, 또는 선호도와 고객이 인지 하는 위험도, 지식, 신뢰도 등에 대하여 정보를 얻고,

이를 Friendman (1996) 의 다변량 적응회귀스플라인모형 (Multivariate Adaptive Regression Splines model)의 모형을 실증적으로 검토 하였다. 다변량 적응회귀스플라인모형을 이용하여 다음 3 개의 모형을 추청한다. 1) 카테고리와 브랜드의 더미를 추가한 변수들이 구매의향에 미치는 효과 모형, 2) 주관적 적합성, 객관적 적합성, 그리고 구매의향의 동시방정식 모형, 3) 공변량이 구매의향에 미치는 효과 모형 (공변량은 상호작용에만 허용)

고객은 주관적 브랜드 적합성 보다 객관적 브랜드 적합성에 더욱 무게를 두고, 이와 같은 결과는 성능적 위험이 구매의향에 미치는 효과가 모든 변수 중 가장 크다는 결과와 같은 맥락에 있다. 고객은 브랜드 확장이 된 물건을 구매할 때 성능적 위험에 가장 많은 무게를 두고 고려하기 때문에 기존의 카테고리와 상이한 카테고리에 신제품을 냈을 때 구매 의향이 가장 크다라는 결과를 도출 하였다.

본 연구는 브랜드 확장의 성공을 위한 가장 이상적인 브랜드 적합성의 정도를 파악할 수 있다는 것에 그 의의가 있다.

주요어: 브랜드 확장, 브랜드 적합성, 다변량 적응회귀스플라인모형 (MARS), 위험, 신뢰, 지식
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