WHEN BRAND EXTENSIONS BACKFIRE: EXPLORING THE RECIPROCAL EFFECT OF NEGATIVE INFORMATION OF BRAND EXTENSIONS ON PARENT BRAND

By

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Brand equity has been highlighted as one of the most valuable assets one company possesses. However, negative information related with brand extension, such as brand extension failures, can lead to negative perceptions, which may be difficult to reverse. Therefore, it is of critical interest to managers and academicians to have better understanding of the effect of brand extension on the parent brand, especially its negative effect. In this research, the focus is to investigate the feedback effect of negative information of brand extension on the parent brand.

This dissertation focuses on how negative information of brand extension impacts the parent brand. It attempts to clarify the previously mixed findings on reciprocal effects of brand extension. More importantly, it endeavors to fill the research gap of examining the

issue of how negative information of brand extension affects the parent brand and to improve the understanding of the process by which negative information of brand extensions causes parent brand dilution, i.e. decreases the consumers' favorable attitudes towards the parent brand. Therefore, the focus of this dissertation was to investigate the effects of brand extension's negative information on consumers' attitudinal evaluation of parent brand, over different levels of brand extension fit, information negativity, and association set size with parent brand. In general, the significant impact of negative information on parent brand evaluation has been enlightened by this research.

DEDICATION

To my dearest husband and parents.

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CHAPTER I

INTRODUCTION

Brand equity has been highlighted as one of the most valuable assets one company possesses (Aaker 1991). In general, brand equity is defined in terms of the marketing effects uniquely attributable to the brand (Keller 1993). One major reason for studying brand equity is a strategy-based motivation to improve marketing productivity. Under the current conditions of fiercer competition, higher costs, and greater demands from customers, companies try to increase the efficiency of their marketing expenses. One popular strategy that companies use to build and leverage equity is using brand extensions that launch new products with the original brand names (Aaker and Keller 1990; Andrewa 1995; Bottomley and Holden 2001; Desai and Keller 2002; Meyvis and Janiszewski 2004; Rangaswamy et al. 1993; Sujan and Bettman 1989). Successful extensions can provide several marketing benefits, such as reducing cost of introduction, gaining distribution and customer trial, and minimizing the risk of new product failures (Aaker 1990). However, negative information related with brand extension, such as brand extension failures, can lead to negative perceptions, which may be difficult to reverse. Therefore, it is of critical interest to managers and academicians to have better

understanding of the effect of brand extension on the parent brand, especially its negative effect. In this research, the focus is to investigate the feedback effect of negative information of brand extension on the parent brand.

Definition and Popularity of Brand Extension

Brand extension has been defined as the use of a brand to introduce products in different categories outside of the parent brand category as a means of achieving higher sales growth rates, higher ROI, and advertising and promotion efficiencies (Baldinger 1990). Brand extensions have been the core of strategic growth for a variety of firms since the 80s. The number of new products is increasing around the world, with the beverage category leading the way, according to Mintel. More than 156,000 new products appeared on store shelves in 2005, with about 16,000 of them launched in the U.S. Beverages—the most active category in food and drink—accounted for nearly a fifth of the introductions (PLMA E-scanner, 2006). Most of the new brands were actually brand extensions. Furthermore, capitalizing on an established brand name is predicted to increase in popularity (Boush and Loken 1991).

Purpose of the Study

The popularity of brand extension strategies has generated great research interest in academia. The Marketing Science Institute has rated brand extensions as one of the most important topics for several years. Early research on brand extensions focused on the transferability of brand equity of parent brands to brand extensions. In other words, studies in this stream delved into how to leverage the existing brand equity to new

products under the same brand name. Most of these studies conclude that the evaluation of a brand extension depends on the strength of the parent brand, and the fit between the core brand and the extension product categories (Bottomley and Holden 2001; Dacin 1994; Farquhar 1990; Meyvis and Janiszewski 2004; Muthukrishnan and Weitz 1990; Park et al. 1991; Smith 1992). Thus, a favorable parent brand can easily have favorable brand extensions compared with an unfavorable parent brand. Also, when the fit between core brand and extension is high, the favorable evaluation of a parent brand is also likely to result in a more favorable evaluation of its extension than when the fit is low.

The subsequent research stream shifted the investigation perspective to the reciprocal effect of brand extensions on parent brand (Anand and Shachar 2004; Balachander and Ghose 2003; Erdem 1998; Erdem and Sun 2002; Martinez and Pina 2003; Morrin 1999; Romeo 1991; Tulin and Sun 2002). However, studies investigating this effect generate mixed findings; negative reciprocal effects, positive reciprocal effects, and no effects can all find support from prior research (detailed review is covered in Chapter II).

Although considerable research has been done in the area of brand extensions and though the amount of research in this area continues to grow, limited attention has been directed towards understanding the effects of negative information a brand extension may have on consumers' attitude toward the parent brand. Instead, the existing research has focused on the dilution effects a brand extension may have on the parent brand caused by lack of fit between the parent brand and the brand extension. For example, rather than considering the effect extension failures in the market have on the core brand, Loken and

John (1993) examined the effects on the parent brand caused by introducing extensions possessing inconsistent attributes with the parent brand and they did find that inconsistent extensions result in the dilution of perceived core brand attributes. The limited research (Romeo 1991) that has examined this specific negative effect has generally found that the negative information of the extensions in the market has caused weak or insignificant damage to the parent brand. Overall there is evidence to support the existence of parent brand dilution due to the introduction of inconsistent extension, but little evidence for the existence of parent brand dilution due to negative information related to extensions in the market. Therefore, this study provides managers with a more focused understanding of the potential reciprocal effects that may occur to their brand when the brand extension encounters negative information. Specifically, this research examined one particular case: when brand extensions are afflicted with negative information, what changes will arise in terms of consumers' attitudes toward the parent brand?

One important factor that has been consistently overlooked is the severity of negative information. Both the category theory and the associative network theory suggest that the level of perceived congruity will influence the processing of the new information, and thus the existing category or schema (Del Vecchio and Smith 2005; Keller and Aaker 1992). However, previous research only focused on the perceived fit between the parent brand and brand extension as the determinant for perceived congruity (Keller and Aaker 1992; Loken and John 1992; Martinez and Pina 2003), but it ignored that the level of the severity of negative information might contribute to a great extent to

whether the negative information is considered as congruent or incongruent with the parent brand.

The other factor that lacks research attention is the association set size of the parent brand. As the size of an association set for a given concept increases, the likelihood of any given associated node being activated is reduced; the more nodes activated, the less likely each node will be activated (Anderson 1980; Anderson 1983; Nelson et al. 1985). The learning of additional facts about a concept creates competition to take strength away from already known facts (Anderson 1983), and activation of a set of nodes can inhibit the activation of other related nodes (Martindale 1991). In view of that, the activated nodes associated with the brand when the consumer makes the evaluation will influence the impact of the negative information on the parent brand. When this factor is omitted from the equation, the explanatory power of any model will obviously decrease.

In sum, this research's main objective is to investigate the effect of negative information of brand extension has on the parent brand. Specifically, three moderators are considered: namely, the perceived fit between parent brand and brand extension, the severity of negative information, and the association set size of the parent brand.

Contributions of the Study

This dissertation focuses on how negative information of brand extension impacts the parent brand. It attempts to clarify the previously mixed findings on reciprocal effects of brand extension. More importantly, it endeavors to fill the research gap of examining the issue of how negative information of brand extension affects the parent brand and to improve the understanding of the process by which negative information of brand

extensions causes parent brand dilution, i.e. decreases the consumers' favorable attitudes towards the parent brand.

This research has several contributions: first, there are no studies that have evaluated the role of severity of negative information in the context of brand extension. The research extends the application of schema theory to brand extension from merely conceptualizing the "congruity" in terms of perceived fit between parent brand and brand extensions to the "congruity" influenced by the severity of negative information. In other words, the strength of the link between the negative extension information and the parent brand is influenced both by the perceived fit between the parent brand and the extension, and the perceived severity of the negative information.

Second, the association set size is another newly introduced concept to brand extension research. This variable reflects the conflicting and interfering effects by other associative nodes of a concept. The more nodes associated with the brand, the less likely one specific node will have a great impact on the overall evaluation of the concept because all activated nodes will compete for attention and processing capacity. Thus, it can be predicted that the larger the association set the parent brand has, the less likely negative information can have a strong damaging effect on the parent brand.

Third, another significance of this study involves methodological issues. Several of the previous reciprocity studies on brand extension have methodological limitations. In particular, one limitation of the previous studies is the amount of information provided to subjects about the parent brand. In general, subjects have been told only the name of the extending brand and the product category of the new product, and then asked to form

evaluations about this extension. The lack of more complete descriptive information about the extension may have resulted in subjects being fairly uninvolved and uninterested in the task (Viswanathan 1997). This low involvement may have contributed to the insignificant reciprocal effects findings. Therefore, this dissertation avoids this limitation by varying the involvement level with the product category when designing for product replicates, and providing an expanded brand and extension description to subjects. Another methodological issue is that some prior research used real brand names in the experiments. Because the real brand name may result in strong and highly accessible attitudes towards the parent brand, the newly introduced limited negative information might not be strong enough to lead to any changes in consumers' attitudes. This research overcomes this methodological limitation by using fictitious brands and providing extensive information about the brands.

Fourth, this research will have benefits for the managerial field. Negative information is very harmful to marketers in terms of their brand management. If they understand how consumers process information and predict the consumers' responses, they can respond properly to negative information about their brands. Therefore, this study will help to answer the following questions:

1. How does a consumer process negative information about a brand extension?
2. To what extent can the consumers' attitude toward the parent brand be changed by the negative information about a brand extension?

3. Under what conditions will the negative information of an extension damage the parent brand?
4. What factors affect the level of damage to the parent brand caused by negative information of brand extension?
5. How can a manager benefit from the answers to the above questions to protect the brand and minimize the damage caused by negative information?

Organization of the Dissertation

This and the following three paragraphs describe the organization of the remainder of the dissertation.

Chapter 2 provides a detailed review of previous brand extension studies including brand extension evaluation studies, reciprocity studies. It also includes a review of negative information studies.

Chapter 3 presents the theoretical background that the research is based on: Mandler's schema incongruity model (Mandler 1982) which incorporates the original schema theory (Anderson 1983), schema-plus-tag model(Graesser and Nakamura 1982), and sub-typing model(Weber and Crocker 1983). Also, Chapter 3 proposes the research model and identifies the specific hypotheses for the study.

Chapter 4 provides a detailed description of the research methodology used in this study. This includes a discussion of the procedures used to design the stimulus, the experimental design, manipulations, samples, and measurement of variables.

Chapter 5 discusses the results of the study, and Chapter 6 provides a discussion of the results, theoretical implications, managerial implications, study limitations, and areas for future research.

CHAPTER II

LITERATURE REVIEW

In this chapter, the advantages and disadvantages of brand extensions are addressed first. The advantages of brand extensions can be explained primarily from two sides: the transfer of the brand equity associated with the original brand to the newly-introduced brand extension, and the spillover effects of brand extensions to the original brand and other products under the same brand name. The disadvantages of brand extensions are usually caused by inconsistent or negative associations of brand extensions to the parent brand.

Following is a review of research on brand extension phenomena. Empirical research found that the transferability of brand equity of a parent brand to brand extension is determined by a group of factors. However, the main focus of the research is on the fit between the parent brand and the extension. Hence, alternative considerations of perceived fit, namely category fit and image fit, are discussed in detail.

The following section provides a review on the reciprocal effects of brand extension to parent brand. Studies finding positive, negative or no reciprocal effects are discussed. Previous research on brand dilution proposed that parent brand dilution could be caused by the lack of fit between the brand extension and the parent brand or the brand

extension failure (Shocker 1995). However, the empirical findings concerning the effects of negative information about brand extensions on the parent brand seem to suggest that negative information about brand extensions do not significantly decrease the favorability of customers' attitudes toward the parent brand as hypothesized (Keller and Aaker 1992; Romeo 1991). Some of the possible reasons for non-significant effects of the extension on the core brand are explored in this section.

Advantages and Disadvantages of Brand Extensions

The popularity of brand extensions strategy is not without ground. The rationale for leveraging the brand name is obvious, especially when the alternatives are considered. As summarized in Table 1, the advantages of brand extensions can be categorized into two perspectives. First, brand extensions can benefit from the established brand name to get easier and faster acceptance. Second, the parent brand can be strengthened or enhanced by brand extensions.

Financial Consideration

One commonly advanced rationale for this proliferation of extensions is companies' motivations to leverage the equity in established brands and develop profitable products relatively easily (Bottomley and Holden 2001; Broniarczyk and Alba 1994; Reddy et al. 1994; Sullivan 1992). The financial risk of entering new markets has become daunting for many consumer product manufacturers. The cost of introducing a new brand in some consumer markets has been estimated to range from $50 million to more than $100 million (Brown 1985), with a total cost estimated to reach $150 million

(Tauber 1988). That spending levels are so high is due in part to the dramatic increase in media costs, the extensive and aggressive use of promotions by established firms, and the cost and difficulties of obtaining distribution. However, even with such huge investments, the successes of the new brands are still not guaranteed. Actually, the percentage of new products that remain successful in the market is not encouraging at all. Only two out of ten new products succeed and some marketing analysts have illustrated the success rate of new product introduction might be as low as one out of ten (Keller 1998). On the other hand, using an established brand name on a new product can considerably reduce the introduction costs, strengthen the effectiveness and efficiency of the market activities and increase the probability of acceptance of the new product, thereby increasing the odds of business success (Morrin 1999). Consequently, it becomes a compelling choice to use established brand names to facilitate entering new markets.

Brand extensions can facilitate new product entrance with much ease and less cost. Cognitive interpretation theory suggests that people give meaning to new information by placing it into existing categories of information (Hawkins et al. 2004). The more radically new the information is, the more difficult it is to interpret. When consumers encounter a new product, they go through a process of examining and assessing the new information. Lack of knowledge and past experience with the new product always creates some uncertainty and barriers for acceptance of the product. However, the linkage between a new product and its parent brand by sharing the same brand name can lessen the uncertainty and lower the barriers. Previous awareness, knowledge, attitudes and experiences with the brand name are already stored in consumers' minds as a schema of the brand, by which all kinds of concepts related to the

brands are linked. By establishing a new link, the new product is very likely to be connected with the extensive associations with the brand. Thus, the new product enjoys instant brand awareness, position, and other brand associations.

Another benefit brand extensions can enjoy is the perceived high quality transferred from the parent brand, which is the basis of sustainable competitive advantages for many businesses and an important antecedent for brand equity (Roux and Lorange 1993; Sheinin 1998; Swaminathan et al. 2001). The signaling theory (Wernerfelt 1988) provides a convincing explanation. It suggests that since profits from other products act as a "performance bond" for the quality of any product with the same brand name, consumers will assume that brand extensions possess the same quality as, or even higher quality than, the parent brand. Likewise, if a new product does not have the same quality as other products with the same brand, it leads consumers to suspect that all other products with the same brand name also have low quality, and the profits from these other products may suffer from this speculation. Accordingly, when a company launches new brand extensions, it is very likely that extensions enjoying an established brand name are of high quality, because a false signal would be costly if the quality of the extension turned out to be poor. Customers will associate less risk with a well-known brand name and are more apt to try the product or service (Kim and Sullivan 1998). The positive associations with the parent brand transferred to the brand extensions can help facilitate the acceptance of the extensions. For example, the perceived high quality suggested by the brand name and trust in the brand reduces the risk perceived by consumers and increases the probability of gaining trial. Once the customers have a positive experience with the products, it is much easier for them to form strong preferences and attitudes

Table 1

Advantages and Disadvantages of Brand Extensions (Keller 1998)

Advantages of Brand Extensions

- Facilitate new product acceptance
  - Enjoy established brand awareness and position
  - Share same brand associations
  - Suggest high perceived quality
  - Reduce risk perceived by customers
  - Increase the probability of gaining trial
  - Permit consumer variety seeking
  - Reduce costs of introductory marketing programs
  - Increase the probability of gaining distribution
  - Increase efficiency of promotional expenditures
  - Avoid cost of developing new brands
  - Allow for packaging and labeling efficiencies

- Provide feedback benefits to the parent brand
  - Clarify brand meaning
  - Enhance the parent brand image
  - Bring new customers into the brand franchise and increase market coverage
  - Revitalize the brand
  - Permit subsequent extensions

Disadvantages of Brand Extensions

- Can confuse or frustrate customers
- Can encounter retailer resistance
- Can fail and hurt parent brand image
- Can succeed bur cannibalize sales of parent brand
- Can succeed but diminish identification with any one category
- Can succeed but hurt parent brand image
- Can succeed but weaken existing brand associations
- Can forgo the chance to develop a new brand
- Can be involved in a disaster

toward the brand extension compared with when they are merely exposed by hearing about or seeing the product from the promotions.

Moreover, brand extensions can permit consumer variety seeking, decrease the costs of gaining distribution, increase the efficiency of promotional expenditures, avoid costs associated with developing new brands and/or allow for packaging and labeling efficiencies (Morein 1975). Besides, creating a bond between a new product and its parent brand can also enhance the efficiency of the promotional activities. By using brand extensions, the company saves a lot on developing new brands, which is both costly in terms of both time and money.

Reciprocal Effects to the Parent Brand

A second motivation for extensions is to obtain reciprocal benefits for parent brands by affecting the image of the umbrella brand favorably, and thereby influence sales of existing products in other product categories. Aaker (1991) suggests that advertising of brand extensions can make advertising for the parent brand more effective, thereby influencing its choice. Empirical evidence has been found for the existence of such reciprocal spillover effects emanating from the advertising of a brand extension (Balachander and Ghose 2003).

One benefit of brand extension is the fortifying effect to the parent brand and the other products. Extensions can and ideally should enhance the core brand. With the right set of brand extensions, the parent brand is, itself, more clearly defined (Morrin 1999).

An extension can develop name recognition and associations among a new group of consumers. It can bring new customers into the brand franchise and increase market coverage by providing a different offering.

With the right strategy of brand extension, further extensions can also be made. Boston Consulting group even proposes that at the mature stage of brand life, one important strategy to further strengthen the brand is to extend to other products or lines (Diamantopoulos et al. 2005). There is economics of information when an umbrella or "range" brand is applied to different products (Aaker 1991; Aaker and Keller 1993; Morein 1975). As Aaker (1991) notes, such economies are realized because "the fixed cost of maintaining a brand name can be spread across different businesses." The implication of this rationale is that umbrella-branded products benefit one another with their advertising because of positive spillover effects, resulting in less advertising expenditure for each product. Likewise, Morein (1975) suggests that economies of information are realized because an advertised product produces a "halo effect" that increases sales of other umbrella-branded products.

Pitfalls of Brand Extensions

However, concerns have been raised that extending brands may have some negative consequences. Negative feedback effects were found to be due mainly to either the lack of fit between the original and extension product categories or failure of the extension products (Shocker 1995). When an extension is inconsistent with the brand image, it can weaken existing brand beliefs, causing confusion and negative affect. When there are weak product-level linkages, associations with specific products and their related

qualities can be diluted. In particular, products that extend brands into increasing disparate categories may fail, and such unsuccessful extensions may weaken brand associations as well as lead to negative affect toward brands (Milberg et al. 1997). It is essential to consider these negative feedback effects, for as Buday (1989) noted, “Each new introduction under a parent brand umbrella forces the consumer to redefine what the name stands for.”

Brand extensions can confuse or frustrate customers. Too many choices suggest that extensive work is needed to make the right decision. In particular, it is even more confusing when the customer equates the brand with the product category it represents. When the brand extends to a different product category, its meaning becomes vague. Also, retailers may be reluctant to accept brand extensions due to the limited shelf space and stocking costs.

The wrong extension could create damaging associations that may be expensive, or even impossible, to change (Ries and Trout 1981). When the brand extension fails, it may hurt the parent brand image because negative associations with new products can be added to the brand.

Brand extensions can also be successful yet still hurt the parent brand image by creating negative associations or weakening existing associations (Keller 1998). To maintain brand image, all brand associations have to be consistent and cohesive. If a successful brand extension conveys a different image than the original brand, it can attach undesirable associations to the original brand. In other instances, the brand extension may succeed, but the identification with the parent product category is diminished. When these situations arise, it is harmful to the brand since the brand loses ownership of the

category. In still other situations, the brand extension can be successful, but it steals customers from the parent brand. This is not what the company wants since the new product replaces the original product. Also, sometimes, it is better to establish a new brand unique in the market. Relying on brand extensions too heavily might cost the company the chance to develop a new brand.

Sullivan (1990) discussed several examples of product disaster. A disaster which is beyond of the control of a firm, such as the discovery that an Ivory model was a pornography star, that Tylenol capsules were tampered with, or that Firestone tires posed a serious safety hazard, can happen to almost any brand name. Yet when the name is used on many products, the damage will be more extensive. An alleged sudden acceleration problem with Audi 5000 cars made after 1978 created adverse publicity that led to a feature on CBS's 60 Minutes in November 1986. Audi's U.S. sales plunged from 74,061 in 1985 to around 30,000 in 1988. A study of the incident's impact on depreciation rates of other Volkswagen products had illuminating findings. The Audi 4000, which had no such problem, was affected nearly as much as the Audi 5000 (7.3% vs. 9.6%); but the Audi Quattro was affected less (4.6 percent) because the Quattro was less closely tied to Audi. The name "Quattro" was separated from "Audi" on the car, and Quattro ads often did not mention Audi. Other Volkswagen names – Porsche and Volkswagen themselves, were not affected (Sullivan 1990).

In sum, an ill-conceived brand extension may lead to many problems. The potential pitfalls of a brand extension could include the diluted parent brand image, weakened existing brand associations, attached negative brand associations, the successful but cannibalizing brand franchise, or forgone opportunity to create a new brand with its

unique associations and growth potential, and even involvement with disasters which are difficult to control (Aaker 1990).

Past Research of Brand Extensions

This section provides a detailed review of brand extension research. It starts with a discussion of the two main theories on which most brand extension research based, and then elaborates on the studies of the transferability of brand equity from parent brands to brand extensions, and finally, it provides an examination of research of the reciprocal effect of brand extensions.

Conceptual Frameworks

Past research tried to find appropriate theories to explain the consumers' processing of brand extension. Brand extension research has generally been based on categorization theory (Anderson 1983; Barsalou 1985; Rosch and Meyvis 1975; Weber and Crocker 1983) and associative network theory (Desai and Keller 2002; Farquhar 1990; Gurhan-canli and Maheswaran 1998; Gwinner and Eaton 1999).

Categorization Theory

Categorization theory posits that when people are exposed to a new instance of a category, they assess the degree to which this new instance is consistent (i.e. fits) with their existing category knowledge (Cohen and Basu 1987). It explains how when consumers are exposed to stimuli they will classify the stimuli in different categories in their memory. The person decides if the stimulus is similar enough to be placed in an

already existing category in their memory or if a new category should be created (Fiske 1982; Fiske and Pavelchak 1986).

Categorization theory posits that when people are exposed to a new instance of a category, they assess the degree to which this new instance is consistent (i.e. fits) with their existing category knowledge (Cohen and Basu 1987). It explains how when consumers are exposed to stimuli they will classify the stimuli in different categories in their memory. The person decides if the stimulus is similar enough to be placed in an already existing category in their memory or if a new category should be created (Fiske 1982; Fiske and Pavelchak 1986).

Similarly, when a family brand introduces a new brand extension, consumers may assess the degree to which the extension is consistent or inconsistent with their family brand associations. The transferability of existing knowledge and beliefs about the original brand to the brand extension and the effect of new extensions on existing brand beliefs and attitudes may depend on this degree of perceived consistency. For example, Mercedes is a brand that is associated with prestige and luxurious cars. If Mercedes introduced a bicycle line, the consumers might find it difficult to accept this brand extension. Whitney (1997) explains, “Categorization theory implies that consumers rarely evaluate a brand extension in isolation.” Consumers evaluate brand extensions by mentally filing them based on previous brand knowledge. The categorization aids consumers in determining product fit or incongruence with their already existing brand categories.

The degree of consistency between an extension and a family brand may depend on a number of factors. Two factors that have emerged from prior brand extension

research are the similarity between an extension and products typically associated with the brand name (Aaker and Keller 1990; Bridges 1990; Bridges 1992; Keller and Aaker 1992; Loken and Roedder 1993; Milberg et al. 1997; Park and McCarthy 1993) and the degree to which extension attributes are consistent with family brand image beliefs (Bridges 1990; Loken and Roedder 1993; Park et al. 1991). What needs to be highlighted is that perceptions of category fit are based on consumers' ability to recognize explanatory links among existing products and extensions and perceptions of how consistent products are with consumers' understanding of the brand image (Bridges 1990).

Categorization theory (Cohen and Basu 1987; Fiske 1982; Fiske and Pavelchak 1986; Sujan 1985) also suggests that when consumers encounter a new product, they evaluate the new product by either a piecemeal or a category-based processing approach, depending on the motivation status and/or the importance of the task. When piecemeal processing is used, an extension is evaluated by a function of inferred brand attribute beliefs and their evaluative importance; and when taking a category-based processing approach, an extension evaluation is a function of some overall attitude toward the original brand. Specifically, if consumers perceive a similarity or "fit" between the original and extension product classes, they would transfer quality perceptions to the new brand extension when they use category-based processing. In fact, categorization research has demonstrated that general affect can be transferred from one object to another. Previous research indicates that category theory is very relevant to brand extension research (Aaker and Keller 1990; Anderson 1980; Barsalou 1983; Boush and Loken

1991; Farquhar 1989; Keller 1993; Milberg et al. 1997; Murphy and Medin 1985; Romeo 1991; Rosch and Meyvis 1975; Whitney 1997).

Associative Network Theory

Associative network theory conceptualizes that when people store information in memory, the information is stored as nodes with links connecting each other. The nodes refer to concepts, and links refer to the relations between concepts. The strengths of the links are also important to the ability one has of recalling one concept with the reminder of the other concept.

The associative network theory has been particularly useful in analyzing the effect of brand associations (Desai and Keller 2002; Farquhar 1990; Gurhan-canli and Maheswaran 1998; Gwinner and Eaton 1999). When applying associative network theory to brand extension research, brands can be considered as schemas, the totality of associations, beliefs, and expectations that consumers have for a brand. Thus, the brand, and the products, as well as beliefs about the brand, are conceptualized as nodes in a knowledge network, and the links between the nodes vary in strength. When extensions are introduced, a particular node (concept) will be triggered and other associative nodes will be "spreadingly" activated. By comparing the new information with those existing concepts, the consumer will decide whether to add the new brand extension to the existing schema. So it is reasonable to predict that if the new brand extension is consistent with the parent brand schema, it will be easily accepted. However the question is what is considered "consistent."

From the previous discussion, although categorization theory and associative network theory examine brand extensions from different angles, they both lead to the importance of "fit" between parent brand and brand extensions. The perceived fit is a complex issue that will be discussed in detail later. Also, in Chapter III, associative network theory will be discussed in depth to introduce hypotheses.

Relevant Research on Brand Extensions Evaluation

With the popularity of brand extensions, there is notable literature investigating various factors that determine the likelihood of acceptance of brand extensions. Specifically, attention has been focused on the function of different variables related to the parent brand (e.g. brand quality, brand reputation, brand breadth, familiarity, etc) and the extension considered (e.g. fit or similarity, consistency, difficulty)(Aaker and Keller 1990; Bottomley and Doyle 1996; Bottomley and Holden 2001; Dacin 1994; Nijssen and Hartman 1994; Park et al. 1991; Sunde and Brodie 1993).

For instance, in Aaker and Keller (1990) research, a direct and indirect effect of the perceived quality of the brand in brand extension acceptance has been found.

Some other identified factors are the number of extensions (Dacin 1994; Keller and Aaker 1992; Morrin 1999), the time of exposure to the extension (Klink and Smith 2001; Swaminathan 1998), the information provided (Aaker and Keller 1990; Klink and Smith 2001), the consumer's motivation (Barone and Miniard 2000; G¨urhan-canli and Maheswaran 1998; Gurhan-canli and Maheswaran 1998), and customer innovativeness (Klink and Smith 2001). Another research stream extended the investigation into strategic perspective. It was found that many strategic factors contribute to the success of brand

extensions, including the appropriateness of a company's corporate structure, applicability of capital resources, size of the company, early entry timing, distinctive marketing competencies, and the ability of personnel in the new market (Balachander and Ghose 2003; Reddy et al. 1994; Sullivan 1992). Table 2 presents a summary of the relevant empirical research on brand extension evaluations.

Generally, a decisive factor frequently examined in the literature on brand extension is the degree of similarity or "fit" between the original brand and the category of the extended product (Aaker 1991). Findings of brand extension evaluation studies indicate that individuals will transfer their beliefs about the brand to the extension if they observe a fit between them (Aaker and Keller 1990; Anderson 1980; Barsalou 1983; Boush and Loken 1991; Farquhar 1989; Keller 1993; Milberg et al. 1997; Murphy and Medin 1985; Romeo 1991; Rosch and Meyvis 1975; Whitney 1997b). For example, Tauber (1988) studied 276 actual extensions and concluded that perceptual fit (whether a consumer perceives the new item to be consistent with the parent brand) is a key element in predicting brand extension success. In other words, the degree of fit has a strong and direct influence on the evaluation of the brand extension: greater perceived similarity between the current and new products leads to a greater transfer of positive or negative affect to the new product.

Since "fit" has triggered such widespread research interest, and has been considered one of the most prominent factors influencing on brand extension evaluations, the following parts are devoted in further discussion on "fit."

Alternative Conceptualization of Perceived Fit

Much research in this stream has been conducted to study how consumers' perceptions of the fit between the extension and the parent brand influence the transferability of previously formed evaluations of the parent brand to brand extension (Aaker and Keller 1990; Bottomley and Doyle 1996; Boush et al. 1987; Chakravarti 1990; Park and McCarthy 1993; Rangaswamy et al. 1993; Reddy et al. 1994; Smith and Andrewa 1995; Sunde and Brodie 1993; Whitney 1997b). Most researchers looked at the fit of a parent or core brand with its extensions in terms of their *similarity*. Aaker and Keller (1990) identified three dimensions of the fit between a parent brand and extensions: 1) complementarity; 2) substitutability, and 3) transferability of skills. Complementarity refers to the extent to which consumers view two product classes as consumed jointly to satisfy some particular need (e.g. camera & films) (Aaker and Keller 1990). Substitutability indicates the extent to which consumers view two product classes as substitutes. Substitute products tend to have a common application and use context such that one product can replace the other in usage and satisfy the same needs (e.g. soda & spring water). Transferability of skills pertains not to how consumers view relationships in product usage, but to how consumers view relationships in product manufacturing. Specifically, transferability reflects the perceived ability of any firm operating in the first product class to make a product in the second product class (e.g. soap & detergent).

Product Category Fit & Product Image Fit

In most research efforts, fit was conceptualized in terms of product category fit as represented by the perceived similarity between the brand's existing product category and the extension's product category (Boush and Loken 1991; Cohen and Basu 1987; Keller 1993; Meyers-Levy and Tybout 1989; Sujan and Bettman 1989). The results of the early brand extension studies indicate that the positive evaluation of

Table 2

Summary of Selected Research on Brand Extension Evaluation

STUDY	PURPOSE	STIMULI	DESIGN	SUBJECTS	DEPEDENT VARIABLES	FINDINGS
Perceived Fit						
Park, Milberg and Lawson (1991)	The importance of product feature similarity and brand concept consistency	Timex, Rolex and ABC watch company	Lab experiment 3x2x2 design	195 M.B.A students	Evaluation of brand extensions	Product feature similarity +; Brand concept consistency +; for both function-oriented and prestige-oriented brands.
Bridges (1991)	Whether established explanatory links between parent brand and the extension affect perceived fit	Two product categories (watch and tennis shoes)	Lab experiment 3x2x2x2 mixed design	181 university staff members	Perceived fit	Brands with dominant attribute-based associations received lower evaluations when extended to a category with no shared physical attributes; Brands with dominant non-attribute based association received lower evaluations when extended to a category with shared physical attributes
Broniaczyk and Alba (1994)	Specific associations of brands on evaluation of brand extensions	Real products	Lab experiments 1. 2x2x2x2 mixed design 2. 2x4x4 design 3. 2x2x2 mixed design	1 -- 76 students; 2 – 159 students; 3 – 45 subjects	Brand extension evaluation	Brand-specific associations may dominate the effects of brand affect and category similarity, particularly when consumer knowledge of the brands is high.
Muthukrishman and Weitz (1991)	Role of product knowledge in evaluation of brand extension	Tennis shoes or golf clubs (6 brands in each); tennis racquet as proposed extension	Lab experiment 2 (high/low familiarity) x2 (+/- attitude toward original brand)	106 subjects (52% female and 48% male)	Attitude toward parent brand/brand extension; similarity	Found moderating effect of the variables of product knowledge and type of similarity judgment between original and new product category and attitude extension

Table 2 (continued)

Summary of Selected Research on Brand Extension Evaluation

Chakravarti, MacInnis, and Nakamoto (1990)	Factors influencing the cognitive process underlying judgments of "fit"	7 well-known brands selected; 5 types of extensions developed for each brand	Lab experiment 2 salient (similar/dissimilar) x2 nonsalient (similar /dissimilar) x2 (cueing) design	267 students	Judgments of similarity, fit, quality, and expected sales	Consumers' judgment of fit between established brand names and new product extensions determined by the associations that are activated and elaborated upon a given situation.
Aaker and Keller (1990)	How consumers form attitudes toward brand extensions	Real original brands	Study 1: survey Study 2: lab. Experiment 2x2x2 factorial design	Study 1: 107 students Study 2: 121 students	Extension attitude	Perceived fit + Perceived high quality of parent brand + Difficulties to manufacture the extension + -- attitude toward the extension
Bottomley and Holden (2001)	Investigate the generalizability of Aaker and Keller's model of how consumers evaluate brand extensions	Data from the original study and 7 replicates	Secondary analysis	A comprehensive data set	Evaluation of brand extension	Evaluations of brand extensions based on quality of the original brand, the fit, and the interaction of the two. Level of contribution of each of these components varies by brand and culture.
Smith (1992)	Factors influence on advertising efficiency of brand extensions	Survey	Survey of product managers; Survey of consumers	181 subjects 70 subjects	Advertising efficiency; similarity; product evaluation; product class knowledge	Fit +; product comprised primarily of search attributes -; Product's relative price +; Distribution intensity +; Consumer knowledge of the product class +;

Table 2 (continued)

Summary of Selected Research on Brand Extension Evaluation

Other Factors						
Boush and Loken (1991)	The effect of brand extension typicality and brand breadth on brand extension evaluation	Brand extension typicality, brand breath	Lab. Experiment; 2(narrow/broad) x 5(typicality) design; two replicates	144 university students	Response times; verbal protocols	Inverted U described the relationship between brand extension typicality and evaluation process measures; Moderately typical extensions evaluated in a more piecemeal and less global way; Attitude to brand extensions correlated with brand extension typicality.
Meyvis and Janiszewski (2003)	Accessibility of benefit association and category associations on success of brand extensions	Six product categories	Lab experiment 2 (similar /dissimilar) x2 (no. of products) x 2 (order) X category replicates	115 undergraduate students	Spontaneous associations	Broad brand + more accessible benefit associations, + successful brand extensions compared with narrow brands.
Dacin and Smith (1994)	The effects of brand portfolio characteristics on consumers' confidence in and favorability of their evaluations of subsequent extensions	Brand portfolio stimuli affiliated with the brand and quality variance	Lab experiments Study 1: 2x2x2 between subjects factorial design Study 2: survey	Study 1: 186 subjects Study 2: 98 subjects	1. extension evaluation; confidence 2. extension quality evaluation; confidence	No. of product affiliated with a brand +; Confidence and favorability of the evaluation; When portfolio quality variance -, positive relationship between No. of products and confidence in extension evaluation +.
Herr Farquhar and Fazio (1996)	How cognitive structure (dominance & relatedness) affect the transfer of associations	FMCG: e.g. Nike tennis rackets; Marlboro Lighters; Swanson Frozen juice; Tylenol cold medicine	Lab experiment	36 paid subjects; 85 individuals (18-41 years old)	Latency; liking for each branded products; relatedness	Strong category-dominant brands +; Closely related brands +

Table 2 (continued)

Summary of Selected Research on Brand Extension Evaluation

Keller and Aaker (1992)	Factors (quality; No. of success and similarity) affecting evaluation of extensions	Seven possible brand extension scenarios	Lab experiment 4x2x2 design	3 groups (29 subjects each)	Evaluation of brand extension; Likelihood to try; Perceived fit; Expertise; Credibility; Trustworthy-ness	Successful intervening extension + (only for average-quality products); Unsuccessful intervening extension – (only for high-quality products)
Dawar (1996)	The role of retrieval in evaluation of fit		Lab experiment 3(context cue) x2 (brand knowledge) x 2 (extension proximity)	130 students	Brand extension evaluation	Single product association: Brand knowledge and context interact to influence evaluations of fit; Multiple product association: Context influence evaluations of fits of brand extensions
Desai and Keller (2002)	The effects of ingredient brand extensions on hose brand extendibility	Real brands	Lab experiment 2 (slot-filler/new attribute) x2 (self-branded/cobranded) x 3 (category replicate) x 3 (order) mixed factorial experiment	262 students	Brand evaluations	Slot-filler expansions, cobranded ingredient Initial acceptance of the brand extension +; Self-branded ingredient Subsequent category extension evaluations +; For new attribute expansion; Co-branded ingredient + for both.

Table 2 (continued)

Summary of Selected Research on Brand Extension Evaluation

Reddy, Holak and Bhat (1994)	Determinants of line extensions success	Econometric model		75 line extensions of 34 cigarette brands		Parent brand strength and its symbolic value, early entry timing, a firm's size and distinctive marketing competencies contribute positively to the success of line extensions
Sullivan (1992)	Whether brand extensions should be introduced early or late in the life cycle of a product category	Historical information taken form advertising age, the wall-street journal, and consumer report	Historical analysis	95 brands in 11 non-durable consumer goods categories	Brand extension survival; Market share analysis	Early-entering brand extensions do not perform as well as average as either early-entering new-name products or late-entering brand extensions

a parent brand is more likely to be transferred to an extension that offers a good degree of fit with the parent brand's existing *product category* than one that fits poorly with the parent brand's existing product category. Affect is transferred from the parent brand to the extension based on how well the extension is perceived to fit with the brand category (Aaker and Keller 1990; Park et al. 1991). Studies have shown that when perceived fit between a brand and an extension is high, consumers are more likely to base their evaluations of the new product on their attitudes toward the parent brand (Aaker and Keller 1990; Boush and Loken 1991; Broniarczyk and Alba 1994; Herr et al. 1996; Park and McCarthy 1993; Park et al. 1991; Reddy et al. 1994).

Further brand extension research has found that consumers' evaluations of the extension are not based solely on the extension's product category fit but are also influenced by brand image fit (Bridges et al. 2000; Broniarczyk and Gershoff 2003; Park et al. 1986). Image fit is a global assessment of fit that can be defined as knowledge, beliefs and feelings the consumer considers when responding to a new product or brand extension (Park et al. 1986). An extension that fits with the parent brand's image is one that is perceived by consumers to share the image associated with the parent brand. When there is image fit between a core brand and its extension, brand concepts help to differentiate a brand from others in the same product category, and thus helps to position brands in consumers' minds (Park et al. 1986). In general, when the image of the parent brand fits with the image of the extension, extension evaluations are more favorable (Bridges et al. 2000; Broniarczyk and Gershoff 2003; Park et al. 1986). Image fit is thought to depend upon the relationships between product features and the company's

effort (through brand names, promotions, etc.) to create meaning from them (Milberg et al. 1997).

To summarize, two kinds of fit between a core brand and its extension have been identified by the research to date: category fit and image fit. One kind of fit is determined mainly by product category, and the other kind of fit is determined by attributes and image. Thus, when evaluating brand extensions, consumers consider the extent to which the extension fits with the parent brand's products and the extent to which the extension fits with the parent brand's image. Together, the two dimensions of fit influence consumers' perceptions of the overall fit of the extension with the parent brand. The two "fit" factors are particularly relevant to managers, as the degree of fit is under the direct control of the company introducing the extension.

Other Considerations

Studies using the fit variable have reached mixed results. There are also quite a few research findings suggesting that fit does not exercise any influence on brand extension evaluations (Broniarczyk and Alba 1994; Park and Srinivasan 1994; Park and V. 1994; Smith 1992). Klink and Smith (2001) found that as extension attribute information increased, the effect of perceived fit on evaluation of an extension disappeared. In Smith and Andrew's (1995) study, the direct effect of fit disappeared when the effect of customer certainty was considered.

Many researchers have argued that too much emphasis has been placed on strict fit in brand extension in previous studies (Dacin 1994; Klink and Smith 2001; Smith and Andrews 1995; Tauber 1988). These researchers have maintained that brands can be

extended to more product categories than researchers previously thought. Tauber (1993) argued that leverage (delivering some benefits in extensions) is more important than fit. According to Boush and Loken (1991), the perception of fit will depend on the variability between the kinds of products marketed under the same brand umbrella (brand breadth) such that the greater the breadth, the more probable it is that links are identified between extensions with little similarities.

Past Research on the Reciprocal Effect of Brand Extensions

There are two potential problems associated with brand extension: 1) that the brand name will not transfer effectively to the new product and 2) that subsequent feedback from the new product will hurt the old ones (Sullivan 1990). While the previous section is devoted to the past research on the first problem, the following section will turn to a brief review of the literature on the reciprocal effect of brand extension.

Once the link between a brand name and a product is established, it remains in the consumer's memory and is difficult to eliminate. After a brand is extended, information revealed about the extension cannot be insulated from the brand's other products. Information about the extension is constantly disclosed from customers' own experiences, unanticipated events, ongoing advertising and other promotional messages. This information can have positive or negative effects on the brand, and the company cannot completely anticipate or control these effects. Table 3 presents the summary of selected empirical research on reciprocal effect of brand extensions

Positive Reciprocal Effect

Extensions can favorably affect the image of the parent brand and thereby influence its choice (Anand and Shachar 2004; Balachander and Ghose 1003: DeGraba and Sullivan 1995; Erdem 1998; Erdem and Sun 2002). The investigation of positive reciprocal effect of brand extension on parent brand has found that brand extensions can increase the perceived quality of the parent brand (explained by signal theory), reduce perceived uncertainty, and increase advertising efficiency and choice probability (Balachander and Ghose 1003: DeGraba and Sullivan 1995; Erdem 1998; Erdem and Sun 2002; Gurhan-canli and Maheswaran 1998).

Erdem (1998) studied the processes by which consumers' quality perceptions of a parent brand are affected by their experiences with brand extensions. Analyzing panel data for two oral hygiene products, the results showed strong support for the consumer premises of the signaling theory of umbrella branding. That is, high-quality brands try to have high-quality extensions, because a poor-quality extension will damage the reputation of the parent brand.

Erdem and Sun (2003) investigated and found evidence for advertising and sales promotion spillover effects for umbrella brands in frequently purchased packaged product categories. The authors also captured the impact of advertising (as well as use experience) on both utility mean and variance across two categories. They show that variance of the random component of utility declines over time on the basis of advertising (and use experience) in either category. This is the first empirical evidence for the uncertainty-reducing role of advertising across categories for umbrella brands.

Balachander & Ghose (2003) examined the reciprocal spillover effects by using scanner panel data and studied such effects emanating from the advertising of a brand extension. They found evidence for a significant reciprocal spillover effect. Specifically, they found that such spillover advertising can increase the choice probability of the parent more than is possible with the parent's own advertising. These results also indicate a strategic benefit from brand extensions whereby a firm introducing the extensions can expect positive reciprocal spillover effects for the parent brand.

Negative Reciprocal Effect

Negative feedback effects were proposed to be mainly due to either failure of the extension product or the lack of fit between the original brand and the extension (Keller and Aaker 1992; Loken and John 1992; Park et al. 1996; Romeo 1991). Evidences were found that the incongruity between the original parent brand and the brand extensions may lead to negative feedback effects.

Loken and John (1993) examined the negative effects an extension may have on the parent brand. They studied only extensions that were lacking in fit to some extent with the parent brand. However, instead of examining the effect an extension has on global evaluations of the parent brand, they focused on the effect an extension may have on specific brand beliefs. They used an actual shampoo as the parent brand and manipulated both category fit and image attribute fit. This study is the first to provide evidence that brand extensions can dilute beliefs about the parent brand (Whitney 1997). The major findings are that brand extensions with image attributes inconsistent with what

consumers expect may lead to dilution of consumers' beliefs that the parent brand is associated with the image attributes.

Milberg et al. (1997) investigated the negative feedback effects of extensions with alternative brand extension strategies. They attempted to examine both positive and negative effects that brand extensions can have on 1) the degree of association between the brand's attributes and the parent brand, and 2) attitudes toward the parent brand. They examined situations in which extensions may dilute family brand beliefs and create negative affect and also showed how a sub-branding strategy may mitigate these effects.

They found negative feedback effects when 1) extensions are perceived as belonging to a product category dissimilar from others associated with the family brand and 2) extension attribute information is inconsistent with image beliefs associated with a family brand. In the context of multiple simultaneous extensions, Milberg et al. found that when a group of brand extensions had a brand concept inconsistent with the parent brand or lacked any product link with the parent brand, subjects lowered their attitudes toward the parent brand.

John et al. (1998) extended the negative reciprocal effect research to flagship products by examining whether extensions can dilute beliefs associated with the flagship product. The findings demonstrated that inconsistent brand extensions could dilute beliefs about individual products as well as beliefs about the parent brand in general. They demonstrated that even when the overall parent brand beliefs are diluted, beliefs about the flagship product could be immune. Beliefs about flagship products are less vulnerable to dilution than beliefs about the parent brand name in general. Flagship products can be

Table 3

Summary of Selected Research on the Reciprocal Effect of Brand Extensions

STUDY	PURPOSE	STIMULI	DESIGN	SUBJECTS	DEPEDENT VARIABLES	FINDINGS
Positive Reciprocal Effect						
Morrin (1999)	Impact of brand extension on memory for parent brand	Dominant /nondomianant brands in eight products category; each includes 2 unextended and 6 extended products	Lab. Experiment 2 (dominant/ nondominant) x2(high/low fit)x3(extension numbers) mixed design	39 Subjects 36 undergraduate students	Categorization speed; Recall measures	Brand extension strengthens parent brand memory structures and facilitates retrieval processes; Impact of extensions moderated by parent brand dominance, extension fit, extension number, and product category crowdedness.
Balachander and Ghose (2003)	Reciprocal spillover effect of brand extensions	Explanatory variables: own ad, spillover advertising; consumer sales promotion; list price; coupon value; brand loyalty	Empirical model	ACNilesen scanner panel data for two product-markets		Significant reciprocal spillover effects when own-advertising effects are weak or nonexistent; Spillover effect from brand extension may be of equal or greater importance than a parent's own advertising
Anard and Shachar (2004)	Multi-product brands as a source of loyalty	Television viewing choices; view's demographic characteristics, and show/product attributes	Empirical model	ACNielsen data		Multi-product firm's portfolio of products affect consumer purchase decision about each of the firm's products; Brand extensions are new channels of spillovers in a multi-product firm.

Table 3 (Continued)

Summary of Selected Research on the Reciprocal Effect of Brand Extensions

Erdem (1998)	The impact of brand extensions on quality perceptions & consumer perceived risk	Frequently purchased packaged product categories	Econometric model	Scanner panel data by ACNielsen for toothpaste and toothbrushes	The choice of a brand	Strong support for positive effect of brand extension on quality evaluation on parent brand based on signaling theory
Erdem and Sun (2002)	Advertising and sales promotion spillover effects for umbrella brands	Frequently purchased packaged product categories	Econometric model	Scanner panel data by ACNielsen for toothpaste and toothbrushes		Found the uncertainty reducing effect of advertising for umbrella brands
No Reciprocal Effect						
Keller and Aaker (1992)	Factors (perceived quality, core brand and the number, success, and similarity of intervening brand extensions) on evaluation of extensions	Seven possible extension scenarios	Lab. Experiment 4x2x2 design	3 groups (29 subjects each)	Evaluations; Perceived fit; Perceived expertise; Perceived trustworthiness; Perceived credibility	Successful intervening extension + evaluation of an average quality core brand; Unsuccessful intervening extension no effect on core brand extension Regardless of the quality level
Romeo (1991)	The effect of negative information on parent brandss	Tropicana	Lab. experiment	80 students	Brand evaluations	Reciprocity+ as similarity+ of extensions increases; Negative information does not hurt parent brand

Table 3 (Continued)

Summary of Selected Research on the Reciprocal Effect of Brand Extensions

Negative Reciprocal Effect						
Loken and John (1993)	Effects of consistency, typicality and accessibility on diluting brand beliefs	A fictitious new brand extensions; 6 brands of shampoo/tissue	Lab. Experiment 3x2x2 factorial design	196 women (18-49 years old)	Perceptions of typicality; Beliefs about the family brand	Inconsistent extension --- dilution effect; Atypical extension --- no dilution effect; Salient typicality of brand extension – no dilution effect.
Martinez and Pina (2003)	The influence of brand extensions on brand image	6 real brands, proposed extensions	Lab. Experiment 2 groups	94 students	Brand image	Found dilution effect; Brand image prior to the extension + Perceived quality extension +; Distance extension – brand image
Milberg, Park and McCarthy (1997)	Inconsistent attribute information and low product similarity on dilution effect	Timex and Polaroid replicates	Lab experiment 2x2x2x2 between-subject design with 2 external control	358 adults at various public locations	Quality; Ease of use; Brand attitudes; fit; competency, expertise, familiarity	Inconsistent attributes of extension -; Dissimilar extensions – Family brand attitude -; Sub-branding mitigates the effect
John, Loken and Joiner (1998)	Whether extensions can dilute beliefs about the flagship product	Six brands of bath powder or six brands of bath oil and three attributes per brand	Lab experiment 3 experiments	Study 1: 192 women; Study 2; 139 women; Study 3: 124 women	Beliefs; Perceptions of inconsistency of brand extension; evaluation	Beliefs about flagship products are less vulnerable to dilution than beliefs about the parent brand name in general

Table 3 (Continued)

Summary of Selected Research on the Reciprocal Effect of Brand Extensions

Karees nd Allen 1991)	The effects of perceived variability (of the company offering and of the entry category) on inference about extensions	Six established product packaged good categories	Lab experiment 3x2 mixed design	60 evening MBA students (40 males and 20 females)	Quality inference; Causal inference; Conditional inference	Brand extension can tarnish global evaluations of a parent brand; Favorably-evaluated parent brand paired with favorably-evaluated brand extensions can lead to a less favorable overall impression of the parent brand
Others						
Jap (1993)	The effect of multiple brand extensions on brand concept	Sixteen health and beauty aid advertisements	Lab experiment; 2x3x2 factorial design	40 students	Brand concept accessibility; brand beliefs; Brand evaluation	Consistent extensions + higher brand concept accessibility, evaluations and accessibility of brand specific beliefs; Independent extensions + , leads to higher accuracy; decreased accessibility of brand beliefs
Gurhan-canli and Maheswaran (1998)	The effect of extensions on brand name dilution and enhancement	Family brand name valence; Motivation; congruency, typicality	Lab experiment 2x2x2x2 between-subjects design	347 undergraduates	Evaluations; Cognitive responses	Typicality of the extension and consumers' levels of motivation determine the effect of extensions on family brand names.

diluted only when the extension information describes a line extension that is associated very closely with the flagship product.

The above discussion of prior research has shown that under certain conditions, important beliefs about a brand name can be diluted by brand extension information. In other words, brand extensions can diminish consumers' feelings and beliefs about a brand name, particularly when the brand extension is perceived as moderately inconsistent with consumers' expectations for the brand.

On the other hand, although the negative feedback effect of the extension failure has been discussed in the literature, only a few studies have empirically examined the potential negative effects of brand extensions caused by extensions' negative information. There have been only two studies to date that specifically examined how knowledge of the negative information of a brand extension affected consumer attitudes toward the family brand name. Both of them found no significant effect (Keller and Aaker 1992; Romeo 1991).

Romeo (1991) considered how negative information about extension and the level of similarity between brand extensions and a brand's other products influenced evaluation of the parent brand. She suggested that brand dilution takes place due to the "ruboff" effect that results from the higher attention getting nature of negative information. She manipulated fit in terms of two factors: category similarity and attribute similarity. Category fit was varied by selecting extensions in the same product category (juice) or in a different product category (sherbet). Attribute fit was varied by using

extensions with attributes similar to the family brand (citrus-related) and extensions with attributes different from the family brand (raspberry). Romeo used core brand image as a dependent measure and she found no evidence that negative extension information diluted the family brand name. Her study also provided no evidence for the proposition that the effect of negative information on parent brand evaluations would vary according to the similarity between the extension and the parent brand. When the extension fit with the parent brand there was a decrease in the evaluation of the parent brand with the negative extension information but this decrease was not significant. The insignificant findings might have been due to the limitation of her manipulation, which provided very limited information about the parent brand and brand extension. Thus, the limited amount of information may have caused subjects to be only minimally involved in the task such that the extension had no reciprocal effect on the parent brand (Whitney 1997). Besides, the use of real brand names (Tropicana) may have resulted in strong and highly accessible attitudes towards the parent brand. Such strong attitudes may not change much in strength based on the limited negative information provided by the researchers.

Keller and Aaker (1992) considered how unsuccessful brand extensions affect fictitious family brand evaluations. They suggest that a high quality parent brand is likely to be damaged by an unsuccessful extension. They examined how consumers' knowledge of the parent brand's quality, knowledge of previous extensions, and perceptions of fit between those products and the proposed extensions affects extension evaluations and parent evaluations. Category fit was manipulated based on the number of

shared features between a core brand product (potato chips) and the proposed extensions (snack crackers, cookies, and ice cream). They used attitude toward the parent brand, and company credibility as dependent measures. Similarly, the study found no evidence of negative feedback effects of negative information irrespective of the degree of similarity between the extension and the core brand product. They also found no evidence that an unsuccessful intervening extension led to a less favorable evaluation of a high quality brand but not of an average quality brand. They did find that a successful intervening extension (in comparison to no intervening extension) led to a more favorable evaluation for an average quality parent brand but not for a high quality brand. In sum, Keller and Aaker (1992) found evidence that a brand extension may enhance overall evaluations of the parent brand when preceded by a successful intervening extension; however, they found no evidence of dilution effects when the brand extension is preceded by an unsuccessful extension. Based on their results, the authors concluded that the evaluation of the parent brand is fairly immune to negative extension information.

There are two significant limitations associated with this study (Whitney 1997). First, as with the Romeo (1991) study, subjects were provided with very little information about the extension. The description of the stimuli and the extension were very brief. Thus, subjects may not have been very involved in the task of evaluating the extension. This low level of involvement may have contributed to the lack of reciprocal effects being found. A second limitation of this study is related to the hypothetical brand names, which does not represent an adequate test of the effect that a brand extension has on the

parent brand. Subjects do not have any existing brand knowledge from which to measure change. Consequently, this study evidently examined how extensions impact the creation of brand attitudes, not how brand extensions change brand attitudes (Whitney 1997a).

Overall, the above discussion of prior research raises important issues with regard to the lack of strong empirical findings for negative reciprocal effects of brand extensions. The need to further explore the phenomena of brand dilution is imminent. Before stepping further into the investigation of this research problem, the research on negative information also needs to be discussed.

Research on Negative Information

Negative information is defined broadly as “certain messages [that] lead to confusion by increasing the number of possible alternatives” (Khorami 1990; Yoon 2003). Negative information often gains differential attention because it is comparably rare and atypical compared with positive information. This differential impact is clearly warranted by extant research. Several studies have revealed that negative information is weighted more heavily than positive information (Yoon 2003). It has been explained that negative information is always rarer compared to positive information; therefore, negative information is more likely to receive more attention, and is consequently perceived as more negative by an audience.

Negative information varies in terms of its severity. To one extreme, it can be ahighly undesirable outcome of product performance which causes severe negative outcomes for consumers. For example, it can refer to some poisonous content in a drink,

or a malfunctioning brake in a car. Some well-known examples of severer negative information concerning a brand include the 1978 Audi 5000 sudden-acceleration problem, the 1982 Tylenol tampered capsule disaster and the 1994 Intel Pentium crisis (Martinez and Pina 2003). On the other hand, the other polar of the negativity continuum can be mildly undesirable outcome of product performance which falls short of the customers' expectations and causes mild negative outcomes for consumers. For instance, mild negative information related with a brand can be an unfavorable taste of a drink or an inconvenient design of a cabinet. Therefore, negative information is conceptualized as a continuum in terms of its severity in this research. It is illustrated in Figure 1.

Figure 1

Continuum of Negative Information

Severe negative information associated with brands, which involves severe negative product performance, usually leads to product recalls. Product recalls are increasing. In 1988, the U.S. Consumer Product Safety Commission was involved in some 221 recalls covering about 8 million product units. Five years later, in 1993, those numbers had risen to 367 recalls covering about 28 million product units. Product crises, and the corresponding recalls for new products occur all too often, and they can have

serious repercussions. In some cases, they have destroyed brands and even companies.

Mild negative information of a brand also always leads to customer dissatisfaction. This dissatisfaction in turn leads to negative attitudes toward the brand and to reactions such as desiring a refund or an exchange for the product, due to a perception that an apology is owed to the consumer and a desire to hurt the firm's business (Folkes 1984).

A lot of companies have already started to pay attention to product crises and confront product crises with a strategic approach that involves prompt public relations programs in order to save the integrity of both the product and the corporation. Undeniably, some companies have handled crises pretty well, kept damage to a minimum and also have found opportunities to reap unexpected benefits (e.g. Saturns' flawed recliner mechanisms and Intuit's erroneous tax software). However, what is left unanswered is that despite the crisis management, how do the customers' evaluation of products and brands change with the impact of product crisis/failure?

Research found that consumers tend to identify the cause of the problems and react accordingly. How people assign the causes will influence their future attitudes and evaluation of the product and the brand. Attribution theory views people as rational information processors whose actions are influenced by their causal inferences (Weiner 2000). Causes have three underlying dimensions (Folkes 1984): stability (whether they are temporary or fairly permanent), locus (whether they are consumer- or firm- related) and controllability (whether they are under volitional control or are constrained). Stability refers to whether causes are perceived as relatively permanent and unchanging or as

temporary and fluctuating (Folkes 1984). Attribution to stable reasons tends to lead to speculation of the future occurrence of problems. Thus, people are more likely to form negative attitudes towards the brand when causes are attributed to permanent reasons instead of when attributed to temporary reasons. Locus refers to whether a cause is consumer-related or firm-related (Folkes 1984). If the firm is held responsible for the negative information related to the brand, consumers are more likely to have a negative attitude toward the brand. On the contrary, if the consumer believes that he/she contributed to the crisis, the negative attitude toward the brand is more likely to be mitigated. Controllability, the last dimension of causes, refers to whether the problems can be controlled. If the consumer realizes that the problem is beyond the firm's control, they might not have a strong negative attitude. However, if the problem is within the control of the firm, the blame to the firm and subsequent negative attitude and evaluation of the product and the brand seems inevitable.

Research suggested that consumers' individual differences also influence the causal attribution of the problem. For instance, it is found that consumers who are more involved in the purchase are likely to be more motivated to engage in causal search for the determinants of the negative information. Further, consumers with more product knowledge or experience with the product class are likely to be more causally complex, i.e., assigning blame for the negative information over a greater number of reasons and are therefore likely to be less certain as to the cause of the negative information. Hence, they are likely to form less extreme beliefs and attitudes about the product.

Chapter Summary

This chapter begins with the definition of brand extension and a discussion of the rationale for brand extension strategies. Following this discussion is a detailed review of the findings and limitations of previous brand extension evaluation research. The last part reviews the research on negative information.

CHAPTER III

HYPOTHESES DEVELOPMENT

This chapter explores about the schema model and the schema incongruity models and their applicability on brand extension research in more detail. Based on further discussion of the moderators of the relationship between product crisis of brand extensions and evaluation of parent brand, a research framework providing the foundations for this study's hypotheses is presented. Following the discussion of the research framework, the hypotheses are presented.

Theoretical Background

The Schema Model

As introduced previously, the schema model, closely related to associative network theory, is pertinent to understanding cognitive processing of incongruity. This model states that a concept is stored in one's memory with relevant associations linked to it. The total of the nodes (associated concepts) and the links (the associations between concepts) is called a schema for a specific concept. For example, brand image can be

defined as the schematic memory of a brand, which contains the consumers' interpretations of a product's attributes, benefits, usage situations, users and manufacturer/marketer characteristics (Keller 1993).

The original version of the schema theory predicts that what is normal, typical, relevant or consistent with pre-existing knowledge will be remembered better than what is unexpected, bizarre, or irrelevant (Elio 1981). Generally, the schema model suggests that new information will be processed easier and faster and is more likely to be accepted if it fits with the existing schema. Similarly, the filtering model proposed in celebrity endorsement research also suggests that spokesperson characteristics which are incongruent with brand schema characteristics will be "filtered out " and not encoded as well as congruent information (Misra and Beatty 1990)

Schema-plus-tag Model

However, the schema-plus-tag model proposed and tested by Graesser and Nakamura (1982) suggests that new incongruent information is stored with prior knowledge (i.e. existing schema) but attached with a set of tags indicating that it is atypical and irrelevant. Atypical events that are specifically tagged are therefore more easily recognized. This salience tends to result in relatively bigger impact of incongruent information on individuals' schemas and attitudes.

A surprise recognition memory test showed that irrelevant actions were remembered better than relevant actions. This major result was consistent with a prediction made by the schema-plus-tag model (Nakamura and Graesser 1985). Another

study testing the memory and reaction time also supported the predictions made by the schema-plus-tag model (Graesser and Nakamura 1982) that atypical events are more likely to be recognized and remembered.

Sub-typing Model

Furthermore, another theory concerning schema incongruity, sub-typing model (Weber and Crocker 1983), indicates that when perceivers respond to new information by seeing it as exceptions to the rule, they place the new information in a subcategory apart from existing knowledge.

Therefore, it is obvious that each model offers a different explanation and thus gives seemingly contradicting predictions for situations that are encountered when new information is incongruent with an existing schema of a concept.

Assume that one has a favorable and positive perception of a brand, and then this individual is exposed to new negative information about the brand extension. Because the parent brand and the brand extension are linked through the same brand name, by spreading activation of connected links (Anderson 1983; Collins 1975), the linkages between parent brand and the negative information may be forged and triggered. According to the original version of schema model, the negative incongruent information obviously does not fit with the existing positive schema of the brand. As a consequence, the negative information will not be remembered very well compared with normal, typical, and consistent information, and in turn it will have a disproportionately lower impact on changes of the individual's schema of, especially, attitude toward the brand.

However, if we apply the schema-plus-tag model, we will get another direction of speculation. Here, the negative information will be put together with a set of tags, indicating that it is atypical and making it more conspicuous and accessible. Therefore, the existing schema of and attitude toward the brand are more likely to be changed by the negative information. Still, the sub-typing model claims that in this situation, instead of modifying the existing schema of the brand, the individual tends to form a new and separate subcategory for this incongruent information. Consequently, the schema of and the attitude toward the brand remain relatively unchanged, and the negative information, together with the brand extension, will be seen as separate and different from the parent brand.

The contradicting speculations based on these theories prompt further investigation of the research problem. The research problem can be restated as follows: Are all three theories: schema model, schema-plus-tag model, and sub-typing model, viable explanations of the effect of negative extension information on a parent brand, or is one more applicable to reality than the others? If all of them are correct explanations, then what factors are modifying the explicabilities of the models?

Mandler's Schema Congruity Model--- Level of Congruity

Mandler's schema congruity model (Mandler 1982) seems to provide an insightful and detailed explanation that can incorporate all of the previous three theories by varying the level of incongruity. Developed from schema theory and the notions of assimilation and accommodation, Mandler (1982) posited that specific types of internal

processes operate in response to different levels of incongruity. The schema congruity model (Mandler 1982) which is illustrated by Figure 2, suggests that individual's existing schema serves as a frame of reference and guides the processing of incongruity. Thus, the degree of fit with the activated schemas (i.e. level of congruity) is likely to determine what specific internal process individuals use when they are faced with new information. Also, attitudes and evaluations are affected through the process of resolving incongruity. Therefore, how successful individuals are in resolving an incongruity within their cognitive schema network will likely influence their affective responses.

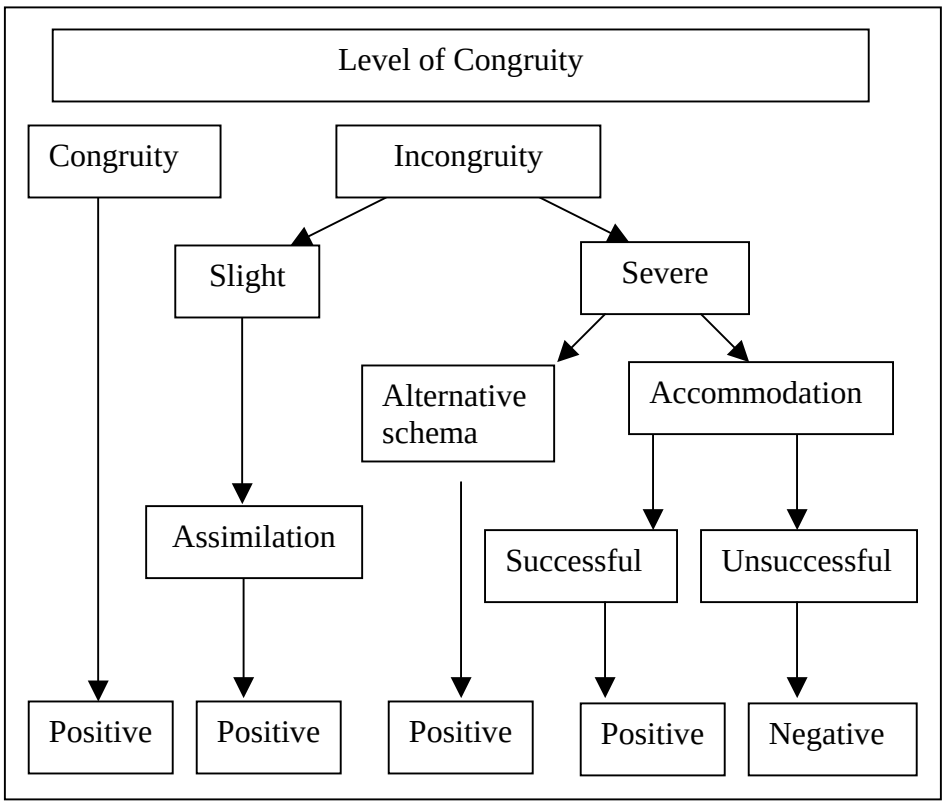

Figure 2

Mandler's Theory of incongruity (1982)

Specifically, Mandler (1982) began with the proposition that congruent information tends to be accepted with mildly favorable response because it does not require resolution and, therefore, is generally predictable and satisfying. Consistent with schema theory, the congruent information fits in with the existing schema quite readily, and thus does not require engaging in the resolution process to solve discrepancies. As a result, the simple process involved makes it easier to integrate congruent information into the existing schema than it does to integrate incongruent information.

In contrast with congruent information, information that contains mild incongruity is believed to generate more extensive processing because people attempt to resolve and find meaning in the incongruity. Usually, moderate incongruities are solved or made sense of by enacting minor changes in one's memory. Therefore, when facing moderately incongruent information, individuals tend to either assimilate the new information or use an alternative schema. Assimilation refers to the placement of the incongruent information into existing schema, which is likely to occur when the new information is slightly incongruent with the existing schema and thus can be easily incorporated into the schema. Alternative schema refers to utilization of other schemas by analogical reasoning in resolving incongruities. Alternative schema involves forming new connections and/or transferring prior knowledge to resolve incongruity, which does not involve drastic changes in current schema structure. Assimilation and alternative

schema processing strategies make heavy use of existing schemas and individual knowledge in facilitating judgments.

The cognitive process of moderately incongruent information proposed by Mandler (1982) generates predictions consistent with the schema-plus-tag model. Whether the incongruent information is directly added to or connected by some new links to the existing schema, it is integrated into the schema. Individuals may have to engage in an effortful cognitive process to be able to reinterpret incongruent information or reorganize current schema structure. The general schema structure is likely changed to the direction of the incongruent information to solve the discrepancy. Also, although the link between the incongruent information and the existing schema is established, the discrepancy between the incongruent information and the existing schema is still conspicuous even after cognitive resolution. Therefore, the moderately incongruent information might exert considerable influence on the existing schema and is likely to change the attitude toward and evaluation of the concept. For example, if some negative information is incorporated into the previously positive schema of a brand, it is very likely that the overall evaluation of the brand will be reduced.

However, if one is faced with severe incongruity, the individual cannot use analogy or transfer prior knowledge from an existing schema to the target incongruity as in assimilation or alternative schema. A new schema is required for this kind of situation. Specifically, in response to severe incongruities, one might restructure his/her knowledge schema or build new associative links between existing schemas that were not previously

connected. This echoes the sub-typing model, which involves the process of filtering out incongruity and encoding it as a special case, resulting in subcategories within a schema. As distinguished from simple assimilation and alternative schema, the sub-typing model reveals that individuals perceive some difficulty in fitting incongruent information into an existing schema. They will typically build a new subcategory and separate the new information from the existing schemas to resolve the severe incongruity.

Thus, this theorizing implies that an inverted U-shaped relationship is likely to exist between brand name incongruity and evaluative responses, assuming that the favorableness of one's feelings associated with either the product or the brand name is not so extreme or strongly held as to overwhelm these more subtle effects (Mandler 1982). Specifically, when the new information is either congruent or extremely incongruent with the existing schema, it does not cause any significant changes in the existing schema; and when the new information is moderately congruent with the existing schema, it has greater influence on the existing schema because individuals engage in extensive processing of the information and integrate the new information into the schema. In other words, the schema incongruity theory suggests that the process of responding to different levels of schema congruity can influence the valence and extremity of affective response.

Mandler's Schema Congruity Model can parsimoniously explain the effect of negative information on a parent brand. The schema model, schema-plus-tag model, and subtyping model may all be considered special cases of the Mandler's schema congruity

model, and the applicability of each model depends on the perceived incongruity of the new information and the existing knowledge and affects with the concept. Therefore, this dissertation uses Mandler's schema incongruity Model as the theoretical background for generating hypotheses.

Hypotheses

Based on the previous literature review and discussion, a research model is presented here in Chapter 3. The relationship depicted in Figure 3 will form the basis of the research hypotheses. The research model identified three factors that might moderate the relationship between negative information of brand extensions and attitude toward the parent brand. The three moderators are "perceived fit between the brand and the extension," "severity of negative information," and "association set size of parent brand."

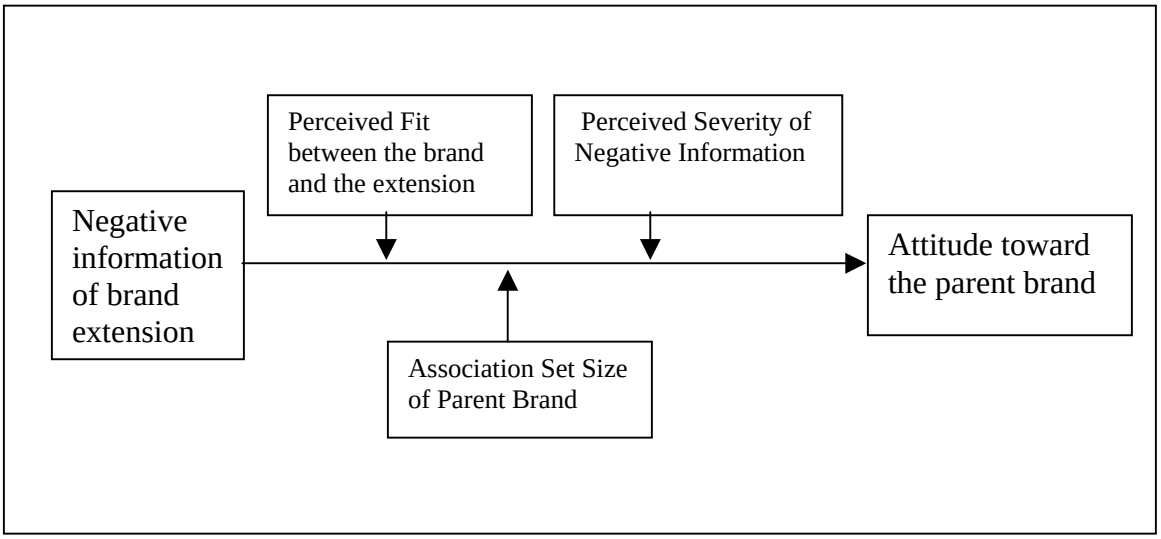

Figure 3

Research Model

The Impact of Negative Information

It is intuitive to speculate that negative information about an extension would be detrimental to the family brand. This is evident from the broad support for the potency of negative information throughout the behavioral and marketing literature. For instance, research has found that negative adjectives are more powerful than positive adjectives (Anderson 1983), and the weights given to negative adjectives have exceeded the weights given to positive adjectives (Romeo 1991). Unfavorable ratings, as compared to favorable product ratings, prompt significantly strong attributions to product performance, belief strength, and affect toward products (Till and Shimp 1998). Literature in various psychological traditions has theorized and/or shown empirically that negative information has disproportionate influence on consumers' beliefs and evaluative judgments (Judd et al. 1991).

When a consumer thinks about a brand, the link with the brand extension node is activated to a certain level through spreading activation (Anderson 1983).The joint activation of the parent brand and the brand extension provides a path over which one's evaluation of the brand extension has an opportunity to transfer to the brand. The key to the process is the simultaneous activation of the parent brand and the brand extension nodes. Negative information about the brand extension activates the brand extension node, which then activates the parent brand to some degree and allows reduced evaluation of the brand extension to transfer to the parent brand. The preceding discussion suggests the following general hypothesis.

> H1: Given a sufficiently strong associative link between a parent brand and brand extension, subsequent negative information about the brand extension will result in lowered evaluations of the parent brand.

Moderator 1: Degree of Perceived Fit

Mandler's schema congruity model differentiates routes of information processing based on the level of incongruity between the new information and the existing schema. In the case of our research problem, the effect of negative extension information on the attitude to the parent brand, two major factors influencing the level of the incongruity between the negative brand information and the existing schema of the brand are identified: namely, "perceived fit between the brand and the extension" and the "severity of the negative information." The first factor has been widely used in research on reciprocal effects of brand extension as reviewed in Chapter II.

The reasoning on the role of fit is as follows. The negative information alone already represents incongruity to the existing positive schema of the brand (assume the consumer has a prior attitude toward the brand is positive). When there is a high fit between the parent brand and the extension, information related to the extension is considered more relevant to evaluating the parent brand than when the fit between the core brand and an unsuccessful extension is low. Also, this information is likely to generate more extensive processing because people attempt to resolve and find meaning in the incongruity. Therefore, the incongruity is deemed mild and is likely to be either assimilated or processed. Similarly, the schema-plus-tag model suggests that the negative

information is integrated into the schema of the brand, and is also salient due to the incongruity. Consequently, when the fit between the core brand and an unsuccessful extension is high, there is a greater negative effect from the extension to the parent brand than when the extension does not fit. This in turn, would imply that the damage to the core brand would be greater when the extension is fit to the parent brand, than when it is not.

Although several previous studies (Keller and Aaker 1992; Romeo 1991) on this moderator for the brand dilution effect did not find significant support, the methodology issues might hinder the investigation. This hypothesis is still proposed in this research while at the same time methodological issues are considered and improved. It is hoped that with the improved stimuli design, the hypothesis can be supported as predicted by theory.

> H2: If negative information is attached to brand extension, consumers are more likely to have negative evaluation of the parent brand when they perceive a strong fit between the parent brand and the brand extension than when the perception is of a weak fit.

Moderator 2: Severity of the Negative Information

Mandler's schema congruity model suggests that the level of incongruity between new information and the existing schema will moderate the effect of the new information on the changes of the existing schema. Severity of the negative information is also a determinant for the level of perceived incongruity. Assuming that the consumer already has a positive perception of the brand, the more severe the negative information is: the

more incongruent the new information is with the existing schema. According to the schema incongruity model, when the new information is considered mildly incongruent with the existing schema, it generates more extensive processing because people attempt to resolve and find meaning in the incongruity. If the negative information is severe, the incongruity between the new information and the existing schema is difficult to resolve. Therefore, the consumer is more likely to form a sub-category for the negative information. Consequently, the strength of the association between the negative extension and the parent brand is unlikely to be strong, and the impact of the negative information on attitude toward the parent brand is not likely to be high. Thus, mildly negative information will have a higher impact on parent brand than will severely negative information. Therefore, the following hypothesis is proposed.

> H3: If negative information is related to the brand extension, consumers are more likely to have negative evaluation of the parent brand when the negative information is mild than when it is severe.

There are several factors that might influence the perceived severity of the negative information: source credibility, involvement, and the importance of the attribute relating to negative information. When an individual receives negative information on a brand, the level of perceived negativity is processed first. The issue of source credibility will influence the perceived severity of the negative information. Information from a highly credible source is more powerful. If source credibility is low, the negative information is likely to be dismissed as untrustworthy. If source credibility is high, negative information is more likely to be accepted.

In addition, the involvement of the consumer will also influence the perceived severity of the information. Petty and Cacioppo's (1991) Elaboration Likelihood Model differentiates high from low involvement. In this model, high involvement messages and low involvement messages are assumed to be processed through two different routes. The consumer's attitude toward a communication message in high involvement is affected by the argument quality. When consumers are highly involved, they actively process more information about the product or service they are considering buying and use what they have learned in a more extensive evaluation process, whereas low involvement implies that consumers do not spend much time evaluating products before they buy them. In low involvement, the consumer's attitude is affected by peripheral cues such as source attractiveness, message length, and so forth. Therefore, according to the level of involvement, the same information might be evaluated differently in terms of severity.

The importance of the attributes to which the negative information is related also influences the perceived severity of the negative information. If the attribute is not important, the information might not be perceived as relevant, thus, the perceived negativity of the information is consequently not very high. However, even though the attribute is unimportant for the current situation, it may have potential importance in the future. The involvement, source credibility, and the importance of the attribute relating to the negative information are all controlled in this research.

Moderator 3: Size of Association Set

An association set represents the preexisting associates, or group of concepts, that are related meaningfully to an object (Nelson et al. 1992). As the size of an association set for a given concept increases, the likelihood of any given associated node also being activated is reduced; the greater the number of concepts activated, the less intensively each will be activated (Anderson 1983; Collins 1975; Nelson et al. 1985). The learning of additional facts about a concept competes and steals attention away from already known facts, and activation of a set of nodes can inhibit the activation of related nodes (Martindale 1991). This basic principle is known as the fan effect.

Interference will be more pronounced for brand names with large association sets, because a greater number of diverse associations might interfere with the activation of specific links. Thus, memory for brand information may be poorer for those brands with a large rather than a small association set (Meyers-Levy 1989).

Provided the association between the originating node and the associated target node is strong, the target node may still activate strongly enough to come into working memory though competing nodes may reduce activation of any one target node (Martindale 1991). Hence, the negative information may trigger the link to parent brand and bring the parent brand name into consumers' memories if the link is strong enough. Activation of negative information about a brand extension can have an adverse effect, through lowered brand evaluations, on the parent brand. Negative information will have a strong effect when the association set size for a parent brand is small. However, when the

parent brand has a larger association set, negative information will not have a significant detrimental effect on the parent brand. This speculation is crucial in that negative information about a brand extension may be problematic for the parent brand only when consumers have scant association sets, or knowledge structures for the parent brand. The negative reciprocal effect of brand extension caused by negative information can be limited if the parent brand already has a large set of positive associations.

From this perspective, the following hypothesis is proposed.

> H4: If brand extension is related with negative information, consumers are more likely to have negative evaluation of a parent brand when the association set with the parent brand is large than when it is small.

Chapter Summary

This chapter examined the schema theory, schema-plus-tag theory and the sub-typing model, each of which generates contradictory speculations on the effect of negative extension information on the attitude toward the parent brand. Mandler's schema congruity model was identified as the parsimonious model which incorporates the above three theories as special cases. The contradiction among the theories is resolved by varying the level of incongruity.

This chapter also identified three moderators for the relationships between negative information of brand extension and the attitude toward the parent brand. Specific hypotheses are proposed after the discussion.

The next chapter presents a detailed discussion of the research method used to perform the study.

CHAPTER IV

METHODS

The previous three chapters introduced the topic of the research, the review of the relevant literature, and the development of hypotheses. This chapter covers the method used in this study. It includes the study overview, pretests, experimentation design, selection of subjects, research instruments, and experiment procedure. Much emphasis is placed upon to the process of the research method.

Study Overview

As discussed above, the main objective of this research is to explore the effect of negative information about a brand extension on the customers' attitudes toward the parent brand. In order to test the proposed hypotheses on these relationships, experimental design with scenarios is selected because that it is the most common research method in brand extension studies (Martinez and Pina 2003) and the use of scenarios has precedent in prior literature in the brand research domain (Yoon 2003).

The experiment used a 2 x 2 x 2 x 2 mixed factorial design. The between-subject variables were severity of negative information (mild/severe), familiarity with the brand (familiar/unfamiliar), and category fit between parent brand and brand extension (same

category/different category). A replication of two product categories was used as a within-subject variable. Subjects were instructed to read these scenarios and then provide their perception and attitudes of the parent brand. Each subject read scenarios (i.e. news stories) from a credible source that disclose negative information about the product performance of the brand extension.

Pretests

An important decision in designing the experiment was whether to use real or fictitious brands. Both ways have its strengths and weaknesses. When using fictitious brands, the problem of projecting the results to the total population are evident (Klink and Smith 2001). Nevertheless, the elevated control of the experimental conditions makes it possible to have greater internal validity (Martinez and Pina 2003) because the effect of other relevant factors is minimized (Churchill and Iacobucci 2002). On the other hand, real brands may aid in determining the real and natural effects of variables, external factors are likely to introduce confounding effects that are beyond the control and interests of the research. Considering all these characteristics, the decision should be based on the specific research context in which one method is more appropriate.

Specifically, there were several concerns about choosing real brands as stimuli in this study. First, a set of brand extensions with comparable levels of variables was required for manipulation. It is easy to find numerous examples of negative information about brand extensions in real world (e.g. over 4000 product recalls and recall alerts can be located on the website of U.S. Consumer Product Safety Commission), considerable difficulties were posed to find 16 real scenarios that fit with each cell of the experiment,

and at the same time, have similar expected levels of variables, although. For instance, to have successful manipulation, we would expect that the perceived negativities of negative information about the four brand extensions (HD, HS, LD, and LS) should be comparably similar for severe and mild conditions. Instances of brands with extensions of the same and different product categories which both have similar levels of severe and mild negative information were difficult to locate. Second, subjects might already know the incidence of the negative information before we impose the treatment. Although the knowledge of the incidence could be checked by asking about the subjects' awareness of the information, the subjects may fail to recall specific information even though they are influenced by it subconsciously. Besides, the association sets for real brands naturally vary from consumer to consumer, rendering any experimental manipulation of association set problematic. Third, if negative information is constructed about the real brand, it might cause problems for the company because the subjects will be influenced by the negative information even though they are told later that the information is fictitious. For these reasons, fictitious brands, extensions, and negative information were used in this experimental design.

A series of pretests were conducted in order to 1) select the two product categories; 2) select the brands; 3) measure perceived fit between parent brand and brand extension, and 4) measure the perceived negativity of the negative information.

Two product categories with which the subjects were familiar were selected. Also, the research was replicated in two product categories varying in terms of level of involvement to increase the generalizability of the research results. According to the above standards, a list of product categories was generated and presented to a group of

subjects different from those chosen for the main study. After examining the two standards, desktop computers and manual toothbrushes were selected as the two product categories in the experiments.

A brand name was selected for each product category. Also, when designing the scenarios, the large association set version had more extensive and detailed information about the brand. For the small association set version, limited information about the brand was provided.

The selection of brand extensions was based on two standards: 1) extensions in the same and different product categories, and 2) real product problems reported in the past. From over 4000 product recalls and recall alerts listed on the website of the U.S. Consumer Product Safety Commission, the two extensions chosen for the desktop computer category were laptop computers (same product category) and plasma televisions (different product category); and the two extensions chosen for the manual toothbrush category were electronic toothbrushes (same product category) and electronic flossers (different product category).

To distinguish the perceived negativity of information for mild and severe conditions, another pretest was conducted. Subjects read the negative information with the disguised brand name and answered questions about the perceived negativity for each case. Poor product reviews were chosen as mild negative information and product recall announcements were chosen as severe negative information

Experimental Design

The overall design was a 2 X 2 X 2 X 2 mixed design, with product category being the within-subjects factor and severity of negative information, category fit between parent brand and brand extension and involvement as the three between-subjects factors.

Each subject received a subset of two of the total set of 16 different scenarios. The two scenarios for each subject were designed to vary in terms of a product category and category fit. In other words, if one scenario consisted of product from category one with the same category extension, the other scenario exposed to the same subject consisted of the opposite level of the variables, namely, a product from category two with a different category extension. Table 4 gives a detailed illustration of the experimental groups. In addition, the sequence of the scenarios for each group was randomized to counterbalance the ordering effect.

Table 4

Experimental Groups

Severity of Negative Information	Association set size	Category fit	Groups
Mild	Large	LSC1 LDC2	Group 1
		LDC1 LSC2	Group 2
	Small	SSC1 SDC2	Group 3
		SDC1 SSC2	Group 4
Severe	Large	LSC1 LDC2	Group 5
		LDC1 LSC2	Group 6
	Small	SSC1 SDC2	Group 7
		SDC1 SSC2	Group 8

L: Large association set size; S: Small association set size
S: same category between parent brand and brand extension;
D: different category between parent brand and brand extension;
C1: product category 1; C2: product category 2;

Subjects

Similar to most of the brand extension research to date this research used a student sample for the first of the two studies (Dawar 1996; Martinez and Pina 2003; Meyvis and Janiszewski 2004; Roedder John et al. 1998). Undergraduates from a large university in the southern region of the United States were recruited to participate in the experiment in exchange for extra course credits. They were randomly assigned to one of the study conditions, and given the appropriate instructions. With 16 groups and 20 subjects for each group, the expected sample size was 320. The other standard for calculating sample size was five subjects per cell per independent variable. To apply this standard to our research, the expected sample size should be at least 240 (5x 16 cells x 3 independent variables). Based on power analysis, the effect size estimated from past similar research is .28 (Yoon, 2003), the acceptable power level is .90, and the significant level is 95%, therefore the needed sample size should be 105 (Kraemer and Thiemann, 1987). In order to meet requirements for meaningful statistical analysis, this research fulfilled all standards in terms of sample size.

As convenient samples, student samples have been used in many past studies (Desai and Keller 2002; Dacin and Smith 1994; Keller and Aaker 1992; Martinez and Pina 2003; Morrin 1999; Romeo 1991). Student sample was used here due to its convenience. It is also appropriate for students to evaluate these consumer products mentioned in the experiments (toothbrushes and computers) because college students frequently use them. Besides, because the main purpose of this dissertation is testing theories rather than trying to extrapolate to the entire market, students are adequate

sample members. However, there have been disputes between proponents and opponents about the use of student sample. Studies with student samples have been criticized regarding their generalizability. Therefore, in addition to the main study which used student sample, a small non-student sample was also used as a replicate. It is hoped that any similarity or discrepancy between the two studies can provide more insight into the influence of negative information on consumers' attitudes on parent brands.

Scenarios

Sixteen scenarios were constructed. Appendix B provided examples of selected scenarios. Each scenario consisted of two parts. The first part contained a description of the brand. The second part provided some recent news revealing negative information about the brand extension. In order to eliminate the variance caused by the source of information, Consumer Reports and the U.S. Consumer Product Safety Commission, which are both highly credible sources, were used as the information source for all 16 scenarios.

Research Procedures

As described above, there were eight different treatments, each of which consisted of two scenarios. The two scenarios were from two different product categories. In addition, one of which was for the same and the other was for the different product category extension. For each of the eight treatments, a treatment with the opposite order of the two scenarios was also constructed. Each subject was randomly assigned to each of the 16 treatment groups.

In study I, the experiment was taken in a class setting. After reading the instructions, the participants' a prior attitude toward each brand was measured. Then, the participants' personal information was collected, including their demographics, and their perceived credibility of the media. Experimental stimuli were next provided and after reading each story, participants' attitudinal responses to the story were measured.

In study II, students enrolled in three marketing classes took the experiment instruments to the respondents. After the respondents answered the questions, students brought the questionnaires back to the experimenters. The instruments used in study two were the same as the instruments used in study one except for the question concerning the education level.

Variables and Measurement

Personal Information. After the participants' a prior attitudes toward the brand were measured, their demographic variables, including ages, genders, education, and incomes were measured. Education level for students was measures as the year in college. Income for students was measured as household income.

Perceived Fit. The degree of the extensions' category fits were assessed with a three-item, seven-point scale (Broniarczyk and Alba 1994; Keller and Aaker 1992; Loken and Roedder 1993; Park et al. 1991). The three items were similar/not similar; consistent/inconsistent and unrepresentative/representative are used to answer the question "…(products) are ___ to/with/of (Brand). "

Perceived Negativity. At first, to test the perceived negativity of information, a three-item, seven-point semantic differential scale (Yoon 2003) (i.e. not negative/very negative, serious/not serious and important/not important were used to answer the question, "To me, the story about the…. is.") However, the face validity check for this scale revealed that the third item (important/not important) did not reflect the same domain as the other two items. Also, Cronbach's alpha was too low. Therefore, a new scale of perceived negativity was developed with four items (negative/not negative; damaging/not damaging; harmful/not harmful; destructive/not destructive ;). First, Based on literature review, the latent construct "perceived negativity" is unidimentional (Yoon 2003). According to Bollen and Lennox (1991), five reflective items pertaining to information negativity have been developed (negative/not negative; damaging/not damaging; harmful/not harmful; destructive/not destructive; serious/not serious. In order to test for its dimensionality, exploratory factor analysis was performed (Churchill, 1979). Only one factor was generated. Since the extracted communality for item "seriousness" was too low (.599), the item was dropped from the scale. The Cronbach's alpha for the remaining scale was .922, which suggested sufficient reliability (Churchill & Iacobucci 2002). Initial test of discriminant validity was also tested between the new scale of perceived validity and extension fit. Two factors were generated by the exploratory factor analysis; all the items of the new scale loaded on one scale and the rest of theitems loaded on the other scale (Churchill & Iacobucci 2002). As to the predictive validity, the scale was also consistent with the manipulation of the degree of negativity of the news stories (Netemeryer et al. 2002).

A Prior Brand Attitude. To measure the valence of brand attitude, a three-item, seven point semantic differential scale (Yi 1991)(i.e. good/bad, unfavorable/favorable, and like/dislike) was used to respond to the question, "please rate your overall attitude toward the Brand X."

Brand Attitude The primary dependent variable was the attitude toward the brand. A participant's attitude was measured using the same scale that was used to measure a participant's a prior brand attitude (a three-item, seven-point semantic differential scale: good/bad, unfavorable/favorable, and like/dislike) (Yi 1991).

Source Credibility To determine respondents' perceived credibility of the media, a four-item, seven-point semantic differential scale (i.e. believable/not believable, trustworthy/not trustworthy, reliable/unreliable, informative/not informative) was used to answer the question, "I consider the source of the above news to be" (Yoon 2003). Factor analysis and Cronbach's alpha showed that the four items construct a unidimensional (Total variance explained = 73%) and internally consistent scale (Cronbach's alpha = .875).

Product Involvement To determine respondents' involvement with the product, a six-item, semantic differential scale adapted from Srinivasan's research (Srinivasan 1987; Srinivasan and Ratchford 1991) was used. The items were: I have a great/no interest in it; It is/isn't fascinating; I have/don't have a compulsive need to know more about it; I am/am not crazy about it; I like/don't like it; and I like/don't like to engage in conversation about it. Principal Component analysis and Cronbach's alpha showed that

the six items construct a unidimensional (Total variance explained = 73%) and internally consistent scale (Cronbach’s alpha =. 875).

CHAPTER V

RESULTS

The research objectives of this study were to examine how the negative information of brand extension influences the consumers' attitudes toward the parent brands and what possible factors moderate this effect. Specifically, the category fit between parent brand and brand extension, the negativity of the brand extension information, and the association set size with parent brand were considered. Product involvement and source credibility were examined as covariates to control for additional variances.

These research objectives were investigated in an experimental setting. This chapter presents the results of data analysis. The pilot study is discussed first, followed by results form study I, and study II.

Pilot Study

Before carrying out the main studies, a pilot study was conducted to examine the scales measuring the constructs and the design of the experiment. Because the sample size was small, only eight versions of questionnaires without counterbalancing versions were handed to 50 students, with 49 usable answers. Each questionnaire received by each respondent consisted of two product scenarios.

First, the validity of the scales was tested. Face validity involves the systematic examination of the content of the instrument to determine whether the instrument provides adequate coverage of the problems or topics included in the study (Kaplan and Saccuzzo 1997). An instrument is said to have a high level of face validity if it contains a representative sample of the universe of subject matter of interest (Netemeyer et al. 2003). Two marketing professors were asked to review the instrument and both agreed that the instruments used in this study had face validity.

Construct validity refers to how well a measure actually measures the construct it is intended to measure. Construct validity is the ultimate goal in the development of an assessment instrument and encompasses all evidence bearing on a measure (Haynes et al. 1999). One part of construct validity is unidimensionality of the sets of items used to measure a given construct (Gerbing and Anderson 1988). Unidimensionaity is whether items measuring a construct measure only that construct. One method used to assess the unidimensionality of items is exploratory factor analysis (Anderson and Gerbing 1988; Clark and David 1995; Gerbing and Anderson 1988; Kumar and Dillon 1987). Another aspect of construct validity is discriminant validity, which is determined by demonstrating that a measure does not highly correlate with another measure from which it should differ (Campbell and Fiske, 1959). An examination of the cross-loadings of items on multiple factors was used to assess how well items discriminate between factors. Thus, construct validity is mainly tested by factor analysis.

In order to use factor analysis, the data has to meet four assumptions (Hair et al. 1998). The first assumption is that the variables in the model are homogeneous, that is,

interrelated. If the data consist of responses from heterogeneous populations, important factors might be missed or covered up in the analysis. On the other hand, interrecorrelations that are too high may indicate a multicollinearity problem and collinear terms should be combined or otherwise eliminated prior to factor analysis. The Kaiser-Meyer-Olkin (KMO) statistic provides a test for sample adequacy which predicts if data are likely to factor well based on correlation and partial correlation (Hair et al. 1998). KMO can also be used to assess which variables should be dropped from the model because they are too multicollinear. Small KMO values indicate that factor analysis is not appropriate because the correlations between the pairs of variables cannot be explained by the other variables. KMO values below 0.5 are unacceptable. For these data, the KMO measure of sampling adequacy was .649. Therefore, the assumption of interrelatedness had been met. The second assumption which must be tested is that the data are normally distributed. Q-Q plots demonstrated that the data were normally distributed.

Finally, factor analysis requires that there be a linear correlation between the items of data. This can be determined by testing the hypothesis that the correlation matrix for the variables is an identity matrix (Hair et al. 1998). Varimax rotation is used here because that a varimax solution yields results that make it as easy as possible to identify each variable with a single factor and it is the most common rotation option. Bartlett's test of sphericity can be employed to perform the task. If the Bartlett statistic is insignificant, the null hypothesis that the data sets are from an identity matrix cannot be rejected, and therefore, factor analysis is not an appropriate technique for use in the

study. In this experiment, the significance level for Bartlett's test of sphericity was <. 001, which led to the rejection of the null hypothesis in favor of the alternate. As a result, it appeared that the variables under analysis were dependent upon one another and that factor analysis could be continued.

Table 5

Rotated Component Matrix for Pilot Study

		Component				
		1	2	3	4	5
Attitude toward the parent brand	Cbgood	.021	.068	-.080	.901	-.080
	Cbfavor	.104	.078	.124	.865	0.49
	Cbneg	-.140	-.016	.004	.633	.337
	Cblike	.102	-.111	-.094	.712	.187
Negativity	Cnegative	-.213	.592	-.314	.254	.152
	Cdamage	-.074	.948	-.067	-.072	.029
	Charm	-.108	.960	-.101	-.041	.055
	Cdestructive	-.069	.951	-.063	.009	.087
Trustworthiness	Cnewsbel	-.057	.127	.012	.179	.890
	Cnewstrus	.024	.050	.092	.127	.916
	Cnewsreli	.174	.075	.116	.052	.785
Brand extension fit	Csim	.026	-.119	.894	.024	.082
	Ccon	-.140	-.190	.965	-.035	-.043
	Crep	-.064	-.041	.874	-.031	.196
Involvement	Cinter	.729	-.068	-.031	-.042	-.029
	Cfasci	.791	-.012	-.205	.084	.189
	Ccom	.900	.057	.082	.032	.044
	Ccraz	.841	-.028	.003	.001	.008
	Clik	.692	-.287	-.084	.021	-.158
	Cenga	.687	-.136	.019	.044	.086

The next step in the factor analysis is to determine the number of factors necessary to represent the data. Principal components analysis (PCA) with varimax rotation was used. Varimax rotation is an orthogonal rotation of the factor axes to maximize the

variance of the squared loadings of a factor on all the variables in a factor matrix, which has the effect of differentiating the original variables by extracted factor. A varimax solution yields results that make it as easy as possible to identify each variable with a single factor. The criteria used to determine the number of factors to extract was an eigenvalue that was greater than or equal to one. The result indicated that five factors had eigenvalues exceeding 1.00. This was the same number of variables tested.

An examination of cross-loadings of items on multiple factors provided evidence about whether items discriminate between constructs. The results from the factor analysis showed that none of the items had cross-loadings on more than one factor (cut-off point for loadings is .40). Therefore, the constructs exhibited adequate discriminant validity.

Reliability has been defined as the "degree to which measures are free from error and therefore yield consistent results"(Churchill 1979; DeVellis. 1991; Nunnally and Bernstein 1994). One aspect of reliability is internal consistency, which is an indicator of the level of homogeneity of a measuring scale (Churchill 1979; Cronbach 1951) According to Nunnally and Bernstein (1994), Cronbach's coefficient alpha should be the measure used to assess the reliability (internal consistency) of any measurement instrument. Coefficient alpha approximates the average of all possible split-half correlation coefficients for a given set of data (Churchill 1979). Nunnally suggested that a set of items with a coefficient alpha value exceeding .7 is considered internally consistent. This statistic was used to assess the internal consistency of the constructs used in this study. All five constructs had coefficient alpha values exceeding .7 (see Table 6).

Based on the above guideline, all coefficient alphas for the variables used in this research are acceptable.

Table 6

Reliability Analysis Using Coefficient Alpha (Pilot Study)

Variable	Number of items	Coefficient Alpha*	Coefficient Alpha**
Attitude toward brand	4	.802	.912
Information Negativity	4	.919	.909
Source credibility	4	.859	.811
Brand extension fit	3	.906	.948
Product involvement	6	.871	.867

* Results based on the first scenario; ** Results based on the second scenario.

Study One – Student Sample

This section presents the results of data analysis of study one. Characteristics of the sample are described, followed by a discussion of data analysis such as testing validity and reliability, manipulation checks, and evaluation of the research hypotheses.

Sample Size and Composition

A total of 384 treatments were administered to students at a large southern university, yielding 362 usable questionnaires for a 94.3% usable response rate. Table 7 presents the demographic profile of the experimental group. Before analysis of the data, a data

screening procedure was conducted. All missing variables were replaced with its group mean value as Tabachnick and Fidell (1996) suggested.

Table 7

Test Sample Demographics

Demographic variable	Value label	Frequency	Percent
RACE	Caucasian	301	83.1
	African American	43	11.9
	Hispanic	2	.6
	Asian/Pacific Islander	7	1.9
	Others	9	2.5
	Total	**362**	**100.0**
Household Income	Missing	8	2.2
	<=$10,000	22	6.1
	$10,000 to $29,999	29	8.0
	$30,000 to $59,999	81	22.4
	$60,000 to $79,999	73	20.2
	$80,000 to $99,999	42	11.9
	>=100,000	107	29.6
	Total	**362**	**100**
Gender	Female	153	42.3
	Male	209	57.7
	Total	**362**	**100**
Education	Freshman	3	.8
	Sophomore	1	.3
	Junior	259	71.5
	Senior	94	26.4
	Graduate	5	1.4
	Total	**362**	**100**
Age	**Mean 22**	**Mode 20**	

Testing validity and reliability

A principle component factor analysis with varimax rotation was performed using the items to measure attitude to brand, category fit, information negativity, product involvement and source credibility. The criteria used to determine the number of factors to extract was an eigenvalue that was greater than or equal to one. The result indicated

that five factors had eigenvalues exceeding 1.00. This was the same number of variables tested.

Table 8

Rotated Component Matrix (Study I)

		Component				
		1	2	3	4	5
Attitude toward the parent brand	Cbgood	.071	.066	.111	.901	.070
	Cbfavor	.101	.020	.045	.860	.028
	Cbneg	-.098	.043	-.010	.538	.181
	Cblike	.106	.149	.123	.835	.043
Negativity	Cnegative	-.166	.729	.218	.016	.030
	Cdamage	-.005	.861	.084	.117	.031
	Charm	-.002	.924	.086	.072	-.055
	Cdestructive	.044	.930	.072	.082	-.040
Trustworthiness	Cnewsbel	.005	.120	.890	.043	.106
	Cnewstrus	-.026	.074	.926	.083	.088
	Cnewsreli	-.065	.083	.768	.044	.125
	Cnewsinfo	.009	.159	.758	.087	.015
Brand extension fit	Csim	-.033	-.012	.074	.072	.834
	Ccon	-.042	-.002	.064	.112	.893
	Crep	-.137	-.019	.170	.143	.763
Involvement	Cinter	.739	.015	.076	-.001	.070
	Cfasci	.839	.029	-.101	.024	-.078
	Ccom	.816	-.002	-.074	.023	-.161
	Ccraz	.853	.010	-.055	.022	-.086
	Clik	.679	-.061	.188	.062	.108
	Cenga	.688	-.067	-.130	.034	-.143

Dimensionality of each of the factors was assessed by examining the factor loadings. The evaluation of dimensionality of items yields confirming results of the unidimensionality of each scale. A review of factor loading is shown in Table 8. The results from the factor analysis showed that none of the items had cross-loadings on more than one factor. Therefore, the constructs exhibited adequate discriminant validity.

Cronbach's coefficient alpha was used to assess the internal consistency of the constructs used in this study. All five constructs had coefficient alpha values exceeding .7. Also, the mean inter-item correlations of five constructs reached the acceptance level given by Clark and Watson (1995) (see Table 9).

Table 9

Reliability Analysis Using Coefficient Alpha (Study I)

RELIABILITY ANALYSIS					
Variable	Number of items	Coefficient Alpha*	Mean Inter-item Correlations*	Coefficient Alpha**	Mean Inter-item Correlations**
Attitude toward brand	4	.872	.631	.892	.670
Information Negativity	4	.917	.730	.900	.690
Source credibility	4	.869	.641	.811	.576
Brand extension fit	3	.839	.640	.887	.726
Product involvement	6	.857	.504	.891	.571

* results from CompleteTeeth; ** results from I-Machine

Manipulation Checks

Manipulation checks were taken for two independent variables- brand extension fit and information negativity, and one covariate: product involvement. Another independent variable is the association set size the consumer previously had with the original brand. It is manipulated by providing a detailed or a brief case study of the brand to subjects. Therefore, there is no variable measuring the perceived size of the association set.

First, a series of univariate ANOVAs was conducted with independent variables (namely brand extension fit, information negativity and association set size) as fixed factors and each of the manipulation checks (perceived brand extension fit and perceived information negativity) as dependent variables. As expected, most independent variables had significant effect on only the corresponding manipulation checks. There was only one unexpected significant effect of information negativity manipulation on perceived brand extension fit for CompleteTeeth. Table 10 lists all the means and significance tests.

Table 10

Manipulation Checks for Independent Variables--- Means (Study I)

Manipulated Independent Variables & Interactions	Manipulation check means for			
	Perceived brand extension fit		**Perceived information negativity**	
	CompleteTeeth	I-Machine	CompleteTeeth	I-Machine
Brand extension fit				
High	2.15[a]	2.48[a]	3.57	3.64
Low	3.20[a]	2.92 [a]	3.49	3.58
Information negativity				
Severe	2.56[b]	2.61	2.92 [a]	2.90 [a]
Mild	2.85[b]	2.78	4.13 [a]	4.39 [a]
Association set size				
Large	2.73	2.75	3.60	3.54
Small	2.67	2.64	3.46	3.68

[a] High vs. Low, Severe vs. mild, Large vs. small means significantly different at $p < .001$ in univariate ANOVA.

[b] High vs. Low, Severe vs. mild, Large vs. small means significantly different at $p < .05$ in univariate ANOVA.

Afterwards, a series of multivariate ANOVA was taken to further examine the manipulations of the independent variables.

Manipulation check for brand extension fit. Four measures of brand extension fit were taken: brand extension similarity, brand extension representation, and brand extension consistency (1=very similar, representative and consistent, 7=very dissimilar, unrepresentative and inconsistent). These four items were averaged to form a composite measure of brand fit (Cronbach's α=. 839 for C and =. 887 for I; C as CompleteTeeth scenario and I as I-Machine scenario). Brand extension fit was analyzed via an ANOVA testing the main and interaction effects of brand extension fit (low, high), information negativity (mild, severe), and association set (small, large).

As expected, brand extension fit was successfully manipulated for C ($\bar{X}_{high}$ =2.15, $\bar{X}_{low}$ =3.20, $F_{(1,360)}$ = 51.75, p =. 000) and for I ($\bar{X}_{high}$ =2.59, $\bar{X}_{low}$ =4.09, $F_{(1,360)}$ = 92.70, p =. 000). With regard to C, no other main effects were significant (p's>.05); however, two interaction effects were found significant: brand extension fit X information negativity ($F_{(1,360)}$ =4.01, p=. 046), and brand extension fit X association set size ($F_{(1,360)}$ =8.13, p=. 005). The first significant interaction indicated that when follow-up information was severely negative, the high (vs. low) brand extension fit produced a relatively smaller difference in perceived brand extension fit ($\bar{X}_{high}$ =2.13, $\bar{X}_{low}$ = 3.48). On the other hand, when follow-up information was mildly negative, the high (vs. low) brand extension fit condition produced a relatively larger difference in perceived brand

extension fit ($\bar{X}_{high}$ = 2.91, $\bar{X}_{low}$ = 2.17). Similarly, the second significant interaction indicated that when follow-up information was severely negative, the detailed (vs. brief) brand information, namely large (vs. small) association set size produced a relatively smaller difference in perceived brand extension fit ($\bar{X}_{large}$ =2.73, $\bar{X}_{small}$ = 2.38). On the other hand, when follow-up information was mildly negative, the detailed (vs. brief) brand information, namely large (vs. small) association set size produced a relatively larger difference in perceived brand extension fit ($\bar{X}_{large}$ =2.61, $\bar{X}_{small}$ = 3.11).

In the case of I, no other main effects were significant (p's >.2) either. However, one interaction effect was significant. Specifically, the ANOVA yielded a significant interaction effect of brand extension fit X association set size (F = 5.15, P=. 024). The means indicated that when the association set size was small, namely, the subjects read a brief description of the company, the high (vs. low) brand extension fit produced a relatively smaller difference in perceived brand extension fit ($\bar{X}_{high}$ =2.57, $\bar{X}_{low}$ = 2.71). However, when the association set size was large, as when respondents were presented with a detailed description of the company, the high (vs. low) brand extension fit condition produced a relatively larger difference in perceived brand extension fit ($\bar{X}_{high}$ =2.39, $\bar{X}_{low}$ = 3.12). Examination of the cell means yielded no obvious interpretation.

Manipulation check for information negativity. Information negativity was measured by four items: negative, damaging, harmful and destructive. All of the items ranged from

1-7 with 1=very negative and 7=very positive, except for item “negative” which is reverse coded. These four items were averaged to form a composite measure of information negativity (Cronbach’s α=. 933 for C and =. 944 for I). Information negativity was analyzed via an ANOVA testing the main and interaction effects of brand extension fit (low, high), information negativity (mild, severe), and association set (small, large). As expected, information negativity was successfully manipulated for C ($\bar{X}_{severe}$ =4.13, $\bar{X}_{mild}$ =2.93, $F_{(1,360)}$ = 60.51, $p < .001$) and for I ($\bar{X}_{severe}$ =4.34, $\bar{X}_{mild}$ =2.91, $F_{(1,360)}$ = 106.02, $p < .001$). With regard to both C and I manipulations, no other main effects or interaction effects were significant.

Manipulation check for product involvement. The scale developed by Srinivasan (1987; 1991) was used to measure product involvement. It includes six semantic differential items (ranges from 1-7; 1= very high involvement and 7= very low involvement). These six items were averaged to form a composite measure of product involvement (Cronbach’s α=. 857 for C and =. 891 for I). As expected, subjects had low involvements with toothbrushes and related products ($\bar{X}_c$ = 4.68) and high involvements with desktop computers and related products ($\bar{X}_i$ = 3.92). Also, involvement with toothbrushes and related products was significantly different from involvement with desktop computers and related products (t_{362} = 70.01 for C, t_{360} = 53.82 for I, p< .001).

Effect sizes--- manipulation checks. As previous analyses revealed, in some cases the manipulations affected the manipulation checks corresponding to variables other than

those for which manipulation was intended. In order to further clarify the manipulation checks, measures of effect size for each independent variable were examined. Measures of effect size in ANOVA are measures of the degree of association between an effect (e.g., a main effect, an interaction) and the dependent variable. They can be thought of as

Table 11

Manipulation Checks for Independent Variables and Interactions –Effect sizes (Study I)

Manipulated Independent Variables & Interactions	**Manipulation Check Effect Size (Partial Eta squared, η_p^2) for:**			
	Perceived brand extension fit		**Perceived information negativity**	
	CompleteTeeth	I-Machine	CompleteTeeth	I-Machine
Brand extension fit	.127 [a]	.300 [a]	.001	.002
Information negativity	.010	.004	.145 [a]	.227 [a]
Association set size	.001	.003	.001	.001
Fit X Negativity	.011	.000	.003	.000
Fit X Association set	.001	.014	.000	.005
Association set X Negativity	.022	.003	.002	.001
Fit X Association set X Negativity	.001	.001	.002	.002

[a] indicated that the variables have large effect on the corresponding manipulation checks.

the correlation between an effect and the dependent variable. If the value of the measure of association is squared, it can be interpreted as the proportion of variance in the dependent variable that is attributable to each effect. Four of the commonly used measures of effect size in ANOVA are: Eta squared (η^2), partial Eta squared (η_p^2), omega

squared (ω^2), and the Intraclass correlation (ρ_I). Eta squared and partial Eta squared are estimates of the degree of association for the sample. Omega squared and the intraclass correlation are estimates of the degree of association in the population. Table 11 depicts the effect size (R) for each independent variable in relation to the manipulation check measures. As can be seen in Table 11, for the two independent variables, the largest effects are obtained on the corresponding manipulation checks and much smaller effects result for the non-responding manipulation checks.

Order Effect. Each participant read two different stories, but the order of the stories could have affected their responses. Several one-way ANOVAs were conducted to examine the order effect on respondents' attitudinal responses. No significant differences were found.

Hypotheses Testing

Before the hypotheses could be tested, the assumptions of ANCOVA had to be tested. The assumptions of ANCOVA are:

*Homogeneity of variances***.** The dependent variable should have the same variance in each category of the independent variable . When there is more than one independent, there must be homogeneity of variances in the cells formed by the independent categorical variables. The reason for this assumption is that the denominator of the F-ratio is the within-group mean square, which is the average of group variances taking group sizes into account. When groups differ widely in variances, the average is a poor summary measure. However, ANOVA is robust for small and even moderate departures

from homogeneity of variance (Box 1954). Levene's test of homogeneity of variance is used to test the ANOVA assumption that each group (category) of the independent(s) has the same variance. If the Levene statistic is significant at the .05 level or better, the researcher rejects the null hypothesis that the groups have equal variances. The Levene's test showed that the null hypothesis could not be rejected for I ($p=0.47$). But for C ($p=0.03$), the Levene's test showed that the null hypotheses were rejected, indicating that the groups did not have equal variances. However, The Levene's test is robust in the face of departures from normality. Failure to meet the assumption of homogeneity of variances is not fatal to ANOVA, which is relatively robust, particularly when groups are of equal sample size (Hair et al 1998).

*Normality***.** For purposes of significance testing, variables should follow normal distributions. The dependent variable is normally distributed in each category of the independent variable(s). Stem-and-leaf displays are visual tests of the assumption that the variables have a normal distribution. Frequency distributions of normal variables will approximate a bell curve when displayed in a stem-and-leaf diagram. Yet ANOVA is robust even for moderate departures from normality. Inspection of the stem-and-leaf displays in this study indicated a moderate deviation from normal distribution for some variables. Some of the demographic variables are modal rather than normally distributed, which is the tendency of nominal data such as sex, or race. Plots are shown in Appendix D.

*Equal or similar sample sizes***.** The groups formed by the categories of the independent(s) should be equal or similar in sample size. The more the groups are similar in size, the more robust ANOVA will be with respect to violations of the assumptions of normality and homogeneity of variance. Equal sample sizes were intended when designing the experiments, and thus, similar sample sizes for cells were achieved.

*Orthogonal independent variables***.** In most ANOVA designs, it is assumed the independent variables are orthogonal (uncorrelated, independent). If there is such a lack of independence, then the ratio of the between to within variances will not follow the F distribution assumed for significance testing. If all cells in a factorial design have approximately equal numbers of cases, orthogonality is assured because there will be no association in the design matrix table (Garson, 2006). The numbers of cases in each cell are approximately equal in the research, thus, the orthogonality assumption had been met.

Since most assumptions of ANCOVA, the main statistical technique for testing hypotheses, have been tested and shown to be met. Slight deviations from assumption were also deemed not vital for ANCOVA analysis. The hypotheses could then be tested with collected data. The discussions of the testing results are as follows.

General hypothesis about attitude change

> H1: Given a sufficiently strong associative link between a parent brand and brand extension, subsequent negative information about the brand extension will result in lowered evaluations of the parent brand.

To test the first hypothesis, it has to be shown that there is significant difference between respondents' original attitudes toward the brand and their attitudes to the brand

after exposure to negative information related to the brand. T-tests suggest that this hypothesis was supported ($\bar{X}_{c1}$ =3.18, $\bar{X}_{c2}$ =4.03; t_1=59.07, t_2=64.00; p< .001). Also, for the second brand (I-Machine), this hypothesis was also supported ($\bar{X}_{i1}$ =2.76, $\bar{X}_{i2}$ =3.73; t_1=50.73, t_2= 59.31; p< .001).

The other three hypotheses examined the relationships between each of the three independent variables (brand extension fit, information negativity, and association set size of brand), and respondents' attitude changes to the brand. Due to potential interrelated relationships among the independent variables, a three-way ANCOVA was taken to test for the relationships. The dependent variable is the attitude change (the difference between $\bar{X}_2$ and $\bar{X}_1$). Product involvement and source credibility were included as covariates. Initially, all demographic variables were also included as covariate; however, none of them were significant. Due to model parsimonies, these variables were omitted from the final analyses.

Hypothesis about brand extension fit

> H2: If negative information is attached to brand extension, consumers are more likely to have negative evaluation of the parent brand when they perceive a strong fit between the parent brand and the brand extension than when the perception is of a weak fit.

Table 12

ANCOVA Table for Study I, CompleteTeeth

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	118.011[b]	9	13.112	7.415	.000	.159
Intercept	26.392	1	26.392	14.924	.000	.041
Cnewsum	33.639	1	33.639	19.022	.000	.051
Cinvsum1	2.232	1	2.232	1.262	.262	.004
stdy1neg	49.072	1	49.072	27.749	.000	.073
stdy1fit	2.808	1	2.808	1.588	.208	.004
stdy1inf	6.819	1	6.819	3.856	.050	.011
stdy1neg * stdy1fit	6.176	1	6.176	3.493	.062	.010
stdy1neg * stdy1inf	.114	1	.114	.065	.800	.000
stdy1fit * stdy1inf	5.723	1	5.723	3.236	.073	.009
stdy1neg * stdy1fit * stdy1inf	.007	1	.007	.004	.951	.000
Error	622.480	352	1.768			
Total	1000.000	362				
Corrected Total	740.491	361				

The second hypothesis focused on the relationship between brand extension fit and attitude change. In the case of C ($F_{(1, 352)}$= 1.59, p=. 208), significant effect of brand extension fit on attitude change was not found. This was also found to be the case with regard to I ($F_{(1, 352)}$= 2.43, p=. 12). The reason for the nonsignificant results might be due to the assumption made before. In order to maintain a sufficient level of fit between the original brand and brand extensions (to differentiate from the carry over effect caused by extremely dissimilar brand extensions), the brand extensions were designed to be different yet not too different. Therefore, if the brand extension still falls into the fit category, and are not radically unrelated with the original brand, the relative difference of

brand extension fit will not have a significant effect on the negative information's impact on the subjects' attitudes toward the brand.

Hypothesis about information negativity

> H3: If negative information is related to the brand extension, consumers are more likely to have negative evaluation of a parent brand when the negative information is mild than when it is severe.

The third hypothesis dealt with the relationship of the severity of negative information and the attitude change. As expected, for C ($F_{(1, 352)}$= 27.75, p< .001), the

Table 13

ANCOVA Table for Study I, I-Machine

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	103.804[b]	9	11.534	5.828	.000	.130
Intercept	18.642	1	18.642	9.419	.002	.026
iinvsum1	26.935	1	26.935	13.609	.000	.037
inewsum	30.746	1	30.746	15.535	.000	.042
stdy2neg	17.364	1	17.364	8.774	.003	.024
stdy2fit	4.814	1	4.814	2.432	.120	.007
stdy2inf	8.326	1	8.326	4.207	.041	.012
stdy2neg * stdy2fit	1.003	1	1.003	.507	.477	.001
stdy2neg * stdy2inf	1.963	1	1.963	.992	.320	.003
stdy2fit * stdy2inf	2.878	1	2.878	1.454	.229	.004
stdy2neg * stdy2fit * stdy2inf	3.020	1	3.020	1.526	.218	.004
Error	696.659	352	1.979			
Total	1140.313	362				
Corrected Total	800.463	361				

results suggested that there was a significant relationship between the severity of negative information and the attitude change. Consistent with C, significant relationship between the severity of information and attitude change of parent brand was also found for I ($F_{(1, 352)}$= 8.77, p=. 003). Mean comparisons for I-Machine suggested there was a significant relationship between extension information negativity and attitude change. However, mean comparisons revealed opposite directions for the hypothesized relationship. Namely, the attitude change caused by severe negative information is higher than that caused by mild negative information both for C ($\bar{X}_{change-severe}$ =1.146, $\bar{X}_{change-mild}$ = .653) and for I ($\bar{X}_{change-severe}$ = 1.250, $\bar{X}_{change-mild}$ =. 443).

Hypothesis about association set size

> H4: If brand extension is related to negative information, consumers are more likely to have negative evaluation of a parent brand when the association set with the parent brand is big than when it is small.

The fourth hypothesis focused on the last independent variable. It proposed that the association set size of the parent brand influenced the extent of brand attitude change. For I ($F_{(1, 352)}$= 4.21, p=. 041), significant relationships were found. Congruently, marginally significant relationships were also found for C ($F_{(1, 352)}$ = 3.86, p=. 050).

Additional Results

Other than the hypothesis testing, product involvement was found to be a significant covariate for I-Machine ($F_{(1, 353)}$= 10.052, p=. 002). However, for CompleteTeeth it is not significant ($F_{(1, 353)}$= 1.85, p=. 174).

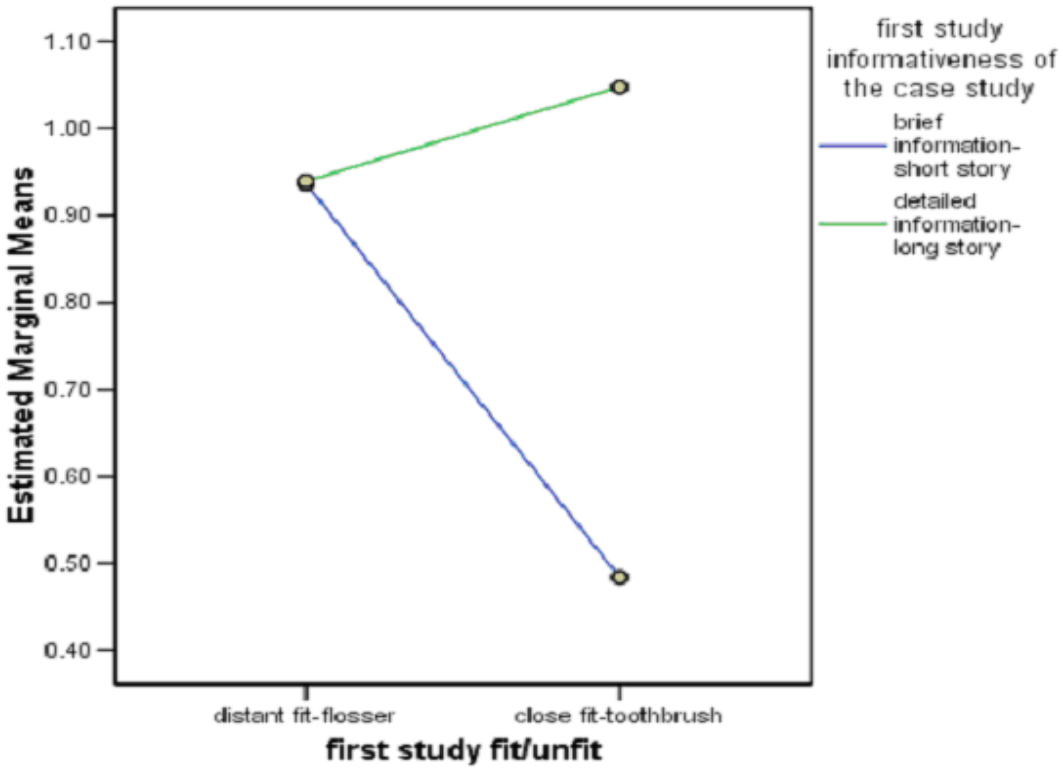

Figure 4

Marginally Significant Interaction between Association Set Size and Extension Fit (Study 1, CompleteTeeth)

No interaction effects between independent variables are hypothesized. Correspondingly, most interactions (two-way and three-way interactions) were not significant. One exception was for CompleteTeeth --- one interaction between brand extension fit and association set size was found marginally significant ($F(1, 352)= 3.49$, $p=.062$). By examining the profile plot, it was found that when subjects have a large

association set with the parent brand, subjects have larger attitude changes when the brand extension fit is high (vs. low). On the other hand, when subjects have a small association set with the parent brand, subjects have a smaller attitude changes when the brand extension fit is high (vs. low).

Study Two – Consumer Sample

This section presents the results of data analysis of study two. Characteristics of the sample are described, followed by a discussion of data analysis such as testing validity and reliability, manipulation checks, and evaluation of the research hypotheses.

Sample Size and Composition

A total of 174 treatments were administered to students at a small midwestern university. Students were asked to find non-student respondents to answer the questionnaires. A total of 138 questionnaires were returned and 132 were usable, accounting for a 75.9% response rate. Table 14 presents the demographic profile of the experimental group. A proper data screening procedure was conducted before analysis of the data. All missing variables were replaced with their group mean values as Tabachnick and Fidell (1996) suggested.

Table 14

Test Sample Demographics For Consumer Sample

Demographic variable	Value label	Frequency	Percent
RACE		2	1.4
	Caucasian	123	88.5
	African American	5	3.6
	Hispanic	2	1.4
	Asian/Pacific Islander	5	3.6
	Native American	1	.7
	Others	1	.7
	Total	**139**	**100.0**
Household Income	Missing	6	4.3
	<=$10,000	7	5.0
	$10,000 to $29,999	12	8.6
	$30,000 to $59,999	28	20.1
	$60,000 to $79,999	25	18
	$80,000 to $99,999	26	18.7
	>=100,000	35	25.2
	Total	107	29.6
Gender	Missing	1	.7
	Female	67	48.3
	Male	71	51.1
	Total	**139**	**100**
Education	Missing	1	.7
	High school/GED	13	9.4
	Some college	41	29.5
	2-year college degree (associates)	14	10.1
	4-year college degree (BA, BS)	52	37.4
	Master's degree	13	9.4
	Doctoral degree	3	2.2
	Professional degree (MD, JD)	2	1.4
	Total	**139**	**100**
Age	**Mean 39.3**	**Mode 47**	

Testing Validity and Reliability

A principle component factor analysis with varimax rotation was performed using the items to measure attitude toward brand, category fit, information negativity, product involvement, and source credibility. The criteria used to determine the number of factors

Table 15

Rotated Component Matrix—Study II

		Component				
		1	2	3	4	5
Attitude toward the parent brand	ebgood	.072	.010	.871	.095	.163
	ebfavor	.049	.024	.892	.130	.130
	ebneg	-.026	.057	.787	.149	.071
	eblike	.009	.019	.852	-.005	.117
Negativity	enegative	-.130	.786	.075	.103	.068
	edamage	-.074	.886	.023	.059	.014
	eharm	-.106	.884	-.002	.052	.112
	edestructive	-.104	.905	.015	.028	.041
Trustworthiness	enewsbel	.077	.029	.039	.858	.201
	enewstrus	.081	.058	.114	.891	.143
	enewsreli	.002	.006	.052	.730	.125
	einformati	.091	.155	.156	.712	.083
Brand extension fit	esim	.065	.117	.143	.168	.850
	econ	.037	.060	.171	.173	.885
	erep	-.016	.058	.163	.103	.867
Involvement	einter	.808	-.182	.088	.063	.039
	efasci	.849	-.103	.085	.116	.068
	ecom	.778	-.058	-.059	-.061	-.040
	ecraz	834	-.116	-.075	.035	-.057
	elik	.784	-.114	.112	.162	.067
	eenga	.715	.061	-.001	-.002	.032

to extract was an eigenvalue that was greater than or equal to one. The results indicated that five factors had eigenvalues exceeding 1.00. This was the same number of variables tested.

Table 16

Reliability Analysis Using Coefficient Alpha(Study II)

RELIABILITY ANALYSIS					
Variable	Number of items	Coefficient Alpha*	Mean Inter-item Correlations*	Coefficient Alpha**	Mean Inter-item Correlations**
Attitude toward brand	4	.890	.667	.888	.684
Information Negativity	4	.922	.665	.933	.749
Source credibility	4	.890	.664	.923	.761
Brand extension fit	3	.869	.799	.921	.848
Product involvement	6	.899	.466	.898	.596

* results from CompleteTeeth; ** results from I-Machine

Dimensionality of each of the factors was assessed by examining the factor loadings. The evaluation of dimensionality of items yields confirming results of the unidimensionality of each scale. A review of factor loading is presented in Table 16. The results from the factor analysis showed that none of the items had cross-loadings on more than one factor. Therefore, the constructs exhibited adequate discriminant validity. Cronbach's coefficient alpha was used to assess the internal consistency of the constructs used in this study. All five constructs had coefficient alpha values exceeding .7, and the

mean inter-item correlations of five constructs reached the acceptance level given by Clark and Watson (1995) (see Table 16).

Manipulation Checks

As is the same as the first study using student sample, manipulation checks were also taken for two independent variables - brand extension fit and information negativity - and one covariate: product involvement.

Table 17

Manipulation Checks for Independent Variables – Means (Study II)

Manipulated Independent Variables & Interactions	Manipulation check means for			
	Perceived brand extension fit		**Perceived information negativity**	
	CompleteTeeth	I-Machine	CompleteTeeth	I-Machine
Brand extension fit				
High	2.15[b]	2.20[a]	3.37	3.23
Low	2.81[b]	3.12[a]	3.49	3.41
Information negativity				
Severe	2.65	2.34[c]	2.91[a]	2.68[a]
Mild	2.51	3.00[c]	3.91[a]	4.01[a]
Association set size				
Large	2.62	2.63	3.35	3.28
Small	2.53	2.69	3.51	3.37

[a] High vs. Low, Severe vs. mild, Large vs. small means significantly different at p< .001 in univariate ANOVA.
[b]High vs. Low, Severe vs. mild, Large vs. small means significantly different at p<.01 in univariate ANOVA.
[c]High vs. Low, Severe vs. mild, Large vs. small means significantly different at p<.05 in univariate ANOVA.

First, a series of univariate ANOVAs was taken with independent variables (namely brand extension fit, information negativity and association set size) as fixed factors and each of the manipulation checks (perceived brand extension fit and perceived information negativity) as dependent variables. As expected, most independent variables only had significant effect on the corresponding manipulation checks. Table 17 lists all the means and significance tests.

Secondly, another series of multivariate ANOVAs was taken to further check the manipulations of independent variables.

Manipulation check for brand extension fit. Four measures of brand extension fit were averaged to form a composite measure of brand fit (Cronbach's α=. 869 for C and =. 921 for I). Brand extension fit was analyzed via an ANOVA testing the main and interaction effects of brand extension fit (low, high), information negativity (mild, severe), and association set (small, large). As expected, brand extension fit was successfully manipulated for C ($\bar{X}_{high}$ =2.15, $\bar{X}_{low}$ =2.81, $F_{(1,137)}$ = 9.06, P =. 003) and for I ($\bar{X}_{high}$ =2.20, $\bar{X}_{low}$ =3.12, $F_{(1,137)}$ = 15.05, P =. 000). With regard to C, one additional main effect was significant. Subjects receiving mild negative information about the product perceived brand extension fit to be higher ($\bar{X}_{severe}$ =2.65, $\bar{X}_{mild}$ =2.51, $F_{(1,131)}$ = 6.51, P =. 012).

In the case of I, there were some unexpected main effects and one interaction. Specifically, Information negativity was significant, indicating that subjects receiving severe negative information about the product perceived brand extension fit to be higher

($\bar{X}_{severe}$ =2.34, $\bar{X}_{mild}$ =3.00, $F_{(1,131)}$ = 7.58, P =. 007). The ANOVA also yielded a significant brand extension fit X association set size ($F_{(1,131)}$ = 5.17, P=. 025). The means indicated that when association set size was small, namely, the subjects read a brief description of the company, the high (vs. low) brand extension fit produced a relatively smaller difference in perceived brand extension fit ($\bar{X}_{high}$ =2.42, $\bar{X}_{low}$ = 2.82). However, when association set size was large, as was the case when respondents were presented with a detailed description of the company, the high (vs. low) brand extension fit condition produced a relatively larger difference in perceived brand extension fit ($\bar{X}_{high}$ = 2.02, $\bar{X}_{low}$ = 3.44).

Manipulation check for information negativity. The four items measuring information negativity were averaged to form a composite measure of information negativity (Cronbach's α=. 922 for C and =. 933 for I). Information negativity was analyzed via an ANOVA testing the main and interaction effects of brand extension fit (low, high), information negativity (mild, severe), and association set (small, large). As expected, information negativity was successfully manipulated for C ($\bar{X}_{severe}$ =3.91, $\bar{X}_{mild}$ =2.91, $F_{(1,131)}$ = 18.08, P =. 000) and for I ($\bar{X}_{severe}$ =4.34, $\bar{X}_{mild}$ =2.91, $F_{(1,131)}$ = 25.56, P< .001). With regard to C, no other main effects or interaction effects were significant (p>.2). However, in the case of I, the ANOVA yielded a significant information negativity X association set size interaction. It indicated that when

association set size was small, namely, the subjects read a brief description of the company, the severe (vs. mild) brand extension fit produced a relatively smaller difference in perceived information negativity ($\bar{X}_{severe}$ =3.75, $\bar{X}_{mild}$ = 3.07). However, when association set size was large, as was the case when respondents were presented with a detailed description of the company, the severe (vs. mild) brand extension fit produced a relatively smaller difference in perceived information negativity ($\bar{X}_{severe}$ =4.23, $\bar{X}_{mild}$ = 2.20).

Manipulation check for product involvement. The six items measuring product involvement were averaged to form a composite measure of product involvement (Cronbach's α=. 899 for C and =. 898 for I). As expected, subjects had a low involvement with toothbrushes and related products ($\bar{X}_{c}$ = 5.23) and a high involvement with desktop computers and related products ($\bar{X}_{i}$ = 4.24). Also, involvements with toothbrushes and related products were significantly different from involvement with desktop computers and related products (t_{138} = 55.49 for C, t_{138} = 35.98 for I, $p < .001$).

Effect sizes--- manipulation checks. Measures of effect size for three independent variables and interactions were examined. Table 18 depicts the effect size for each independent variable and interactions in relation to the manipulation check measures.

Table 18

Manipulation Checks for Independent Variables and Interactions – Effect sizes (Study II)

Manipulated Independent Variables & Interactions	**Manipulation Check Effect Size (Partial Eta squared, η_p^2) for:**			
	Perceived brand extension fit		**Perceived information negativity**	
	CompleteTeeth	I-Machine	CompleteTeeth	I-Machine
Brand extension fit	.074	.103	.002	.003
Information negativity	.003	.055	.121	.163
Association set size	.000	.004	.009	.005
Fit X Negativity	.007	.017	.002	.005
Fit X Association set	.001	.038	.001	.008
Association set X Negativity	.000	.008	.001	.049
Fit X Association set X Negativity	.005	.028	.000	.002

As shown in the columns of Table 18, for the two independent variables, the largest effects are obtained on the corresponding manipulation checks and much smaller effects result for the non-responding manipulation checks.

Hypotheses Testing

Similar to study one, most of the assumptions of ANCOVA (homogeneity of variances, multivariate normality, equal or similar sample sizes and orthogonal independents) were fulfilled.

General hypothesis about attitude change

> H1: Given a sufficiently strong associative link between a parent brand and brand extension, subsequent negative information about the brand extension will result in lowered evaluations of the parent brand.

This hypothesis proposed that there is significant difference between respondents' original attitudes toward the brand and their attitudes to the brand after exposure to negative information related to the brand. This hypothesis was supported for C ($\bar{X}_{c1}$=3.17, $\bar{X}_{c2}$=4.40; t_1=42.75, t_2=39.80; p< .001) and for I ($\bar{X}_{i1}$=2.69, $\bar{X}_{i2}$=4.07; t_1=31.43, t_2= 37.69; p< .001).

The other three hypotheses examined the relationships between each of the three independent variables (brand extension fit, information negativity, and association set size of brand), and respondents' attitude changes to the parent brand. Due to potential interrelated relationships among the independent variables, a three-way ANCOVA was taken to test for the relationships. The dependent variable is the attitude change (the difference between $\bar{X}_{c2}$ and $\bar{X}_{c1}$). Product involvement and source credibility were included as covariates. Initially, all demographic variables were also included as covariates, however, none of them were significant. Due to model parsimonies, these variables were omitted from the final analyses.

Table 19

ANCOVA Table for Study 2, CompleteTeeth

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	92.800[b]	9	10.311	7.375	.000	.340
Intercept	8.549	1	8.549	6.114	.015	.045
Cinvsum1	.184	1	.184	.131	.718	.001
Cnewsum	1.818	1	1.818	1.300	.256	.010
stdy1neg	39.181	1	39.181	28.023	.000	.178
stdy1fit	8.512	1	8.512	6.088	.015	.045
stdy1inf	6.463	1	6.463	4.622	.033	.035
stdy1neg * stdy1fit	29.179	1	29.179	20.870	.000	.139
stdy1neg * stdy1inf	3.997	1	3.997	2.859	.093	.022
stdy1fit * stdy1inf	1.539	1	1.539	1.101	.296	.008
stdy1neg * stdy1fit * stdy1inf	1.987	1	1.987	1.421	.235	.011
Error	180.362	129	1.398			
Total	499.188	139				
Corrected Total	273.162	138				

Hypothesis about brand extension fit

> H2: If negative information is attached to brand extension, consumers are more likely to have negative evaluation of the parent brand when they perceive a strong fit between the parent brand and the brand extension than when the perception is of a weak fit.

The second hypothesis focused on the relationship between brand extension fit and attitude change. In the case of C ($F_{(1, 129)}$= 6.09, p=. 015), significant effect of brand extension fit on attitude change was found. High-fit brand extensions caused larger changes of brand attitude toward the parent brand D ($\bar{X}_{change-highfit}$ =1.492, $\bar{X}_{change-lowfit}$ = 1.054). However, with regard to I, no evidence was found to support the significant effect of brand extension fit on attitude change ($F_{(1, 129)}$= .507, p=. 478).

Table 20

ANCOVA Table for Study 2, I-Machine

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	63.943[b]	9	7.105	4.737	.000	.248
Intercept	8.273	1	8.273	5.516	.020	.041
inewsum	.362	1	.362	.241	.624	.002
iinvsum1	4.590	1	4.590	3.060	.083	.023
stdy2neg	41.964	1	41.964	27.980	.000	.178
stdy2fit	.760	1	.760	.507	.478	.004
stdy2inf	5.391	1	5.391	3.595	.060	.027
stdy2neg * stdy2fit	.059	1	.059	.039	.844	.000
stdy2neg * stdy2inf	2.809	1	2.809	1.873	.174	.014
stdy2fit * stdy2inf	2.473	1	2.473	1.649	.201	.013
stdy2neg * stdy2fit * stdy2inf	2.020	1	2.020	1.347	.248	.010
Error	193.474	129	1.500			
Total	522.625	139				
Corrected Total	257.416	138				

Hypothesis about information negativity

> H3: If negative information is related to the brand extension, consumers are more likely to have negative evaluation of a parent brand when the negative information is mild than when it is severe.

The third hypothesis dealt with the relationship of the severity of negative information and the attitude change. As expected, for C ($F_{(1, 129)}= 28.02$, $p< .001$), the results suggested that there was a significant relationship between the severity of negative information and the attitude change. Consistent with C, significant relationship between the severity of information and attitude change toward the parent brand was also found for I ($F_{(1, 129)}= 27.98$, $p< .001$). However, mean comparisons revealed opposite directions for the hypothesized relationship. Namely, the attitude change caused by severe negative

information is higher than that caused by mild negative information both for C($\bar{X}_{change-severe}$ = 1.825, $\bar{X}_{change-mild}$ =. 764) and for I($\bar{X}_{change-severe}$ =1.927, $\bar{X}_{change-mild}$ = .795).

Hypothesis about association set size

> H4: If brand extension is related to negative information, consumers are more likely to have negative evaluation of a parent brand when the association set with the parent brand is big than when it is small.

The fourth hypothesis focused on the last independent variable. It proposed that the association set size of the parent brand influences the extent of brand attitude change. For C ($F_{(1, 129)}$ = 4.62, p=. 033), significant relationships were found. Congruently, marginally significant relationships were also found for I ($F_{(1, 129)}$ = 3.60, p=. 060).

Other than in the hypothesis testing, product involvement was not found to be a significant covariate for either CompleteTeeth ($F_{(1, 129)}$ = .13, p=. 718) or for I-Machine ($F_{(1, 129)}$= 3.06, p=. 083). Source credibility was not found to be a significant covariate for neither C ($F_{(1, 129)}$ = 1.300, p=. 256) nor I ($F_{(1, 129)}$= .241, p=. 624).

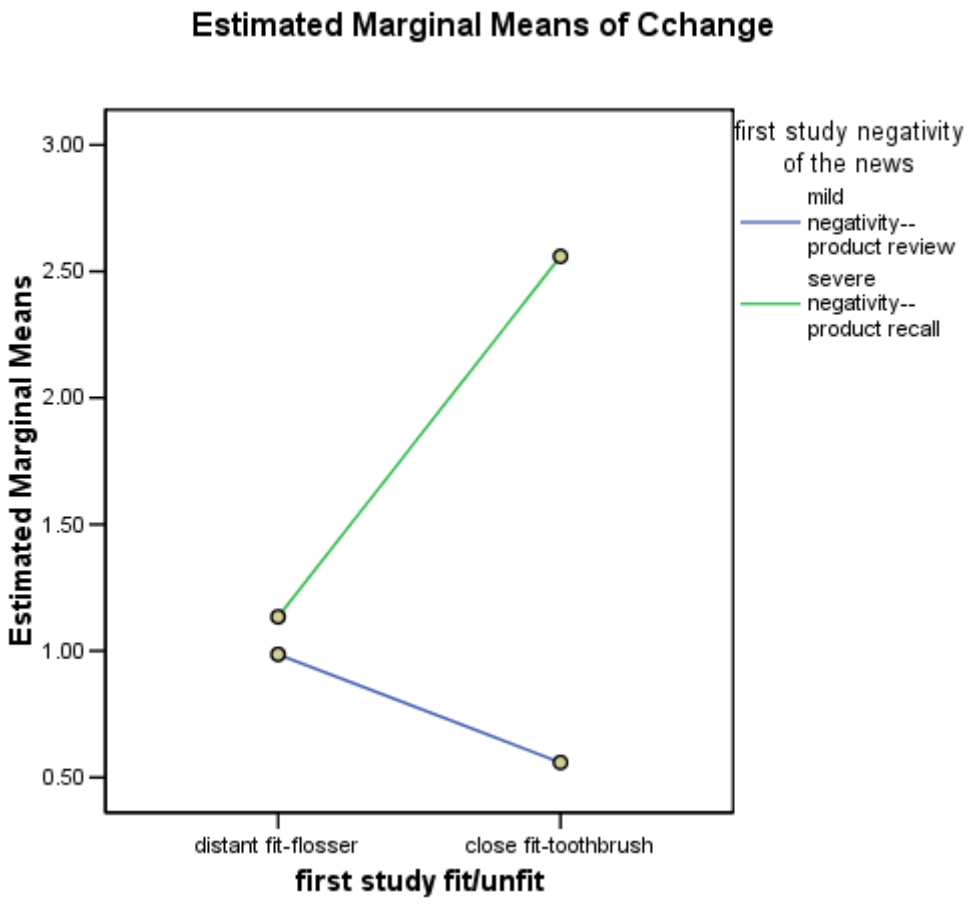

Figure 5

Significant Interaction Between Brand Extension Fit and Information Negativity (Study 2, CompleteTeeth)

No interaction effects between independent variables are hypothesized. Correspondingly, most interactions (two-way and three-way interactions) were not significant. One exception was for CompleteTeeth, one interaction between brand extension fit and information negativity was found significant ($F_{(1, 130)}= 20.87$, $p< .001$.) By examining the profile plot (see Figure 5), it was found that when subjects received severely negative product information, they had larger attitude change when the brand

extension fit was high (vs. low). On the other hand, when subjects received mildly negative information, they had smaller attitude change when the brand extension fit was high (vs. low).

CHAPTER VI

DISCUSSION

In this chapter, the research undertaken in this dissertation is first overviewed. Results are then discussed and implications and limitations of the research are addressed. Finally, directions for future research are suggested.

Research Overview

As discussed previously, brand extension strategy is popular as a new product introduction strategy. The strategy is so widely employed because it builds and communicates strong brand positioning, enhances awareness and quality associations, increases the probability of product trials by lessening new product risk, exploits the marketplace growth opportunities and leverages positive brand equity (Dawar and Anderson 1994; Park and Srinivasan 1994; Shocker et al 1994; Keller 1993).

In studying consumer perceptions of brand extensions, marketing scholars have investigated determinants of consumers' brand extension evaluations, focusing largely on brand affect and similarity of brand extension to the core brand. An issue particularly relevant to the reciprocal effect of brand extension on the parent brand and its original

product, which has not as yet been investigated in depth, is the issue of the negative information of brand extension and its influences on parent brand evaluation. Therefore, the focus of this dissertation was to investigate the effects of brand extension's negative information on consumers' attitudinal evaluation of parent brand, over different levels of brand extension fit, information negativity, and association set size with parent brand. Consequently, the overarching hypothesis investigated in this dissertation was that brand extension's negative information decreases consumers' evaluations of the parent brand. Three aforementioned variables were proposed as moderating the effects of negative brand extension information on consumers' evaluations of the parent brand. Specifically, for an extension perceived to be fit with the parent brand, negative brand extension information is likely to have a greater influence on consumers' attitudinal evaluation of the parent brand. While for perceived unfit brand extensions, then, negative brand extension information is likely to have a lesser influence on evaluation of the parent brand. Similarly, severe negative brand extension information has a smaller impact on attitude to the parent brand than mild negative brand extension information. These first two hypotheses were supported by the Mandler hypothesis (Mandler 1982), which states that stimulus incongruity prompts elaboration in an effort to resolve incongruity and suggests that additional processing of incongruent information will occur, and lead to greater impact of the information when the new information is moderately incongruent with existing schema of the parent brand. The third hypothesis suggested that when consumers have a larger association set size with the parent brand, the impact of negative

brand extension information on parent brand evaluation is smaller compared with when consumers have a smaller association set size with the parent brand. In summary then, the purpose of this dissertation was to extend the brand extension literature to consider the role of negative brand extension information in brand extension evaluations. The underlying predictions were investigated by examining parent brand evaluation change (i.e., H1, H2, H3, H4).

The experiment used a 2 x 2 x 2 x 2 mixed factorial design. The between-subject variables are severity of negative information (mild/severe), familiarity with the brand (familiar/unfamiliar) and category fit between parent brand and brand extension (same category/different category). A replication of two product categories is used as a within-subject variable. The key dependent measure was perceived attitude change of the parent brand. A series of pretests were conducted to identify parent brands and categories, extension product categories, brand information and negative extension information. Stimuli were chosen based on the pretest results. Specifically, manual toothbrush and desktop computer category were chosen as the low-involvement and high-involvement parent brand category. Fictitious brands, CompleteTeeth for manual toothbrush and I-Machine for desktops were taken for research. Electric toothbrush and electric flosser were chosen as the fit and unfit brand extensions for CompleteTeeth, and laptop computer and plasma television were chosen as the fit and unfit brand extensions for I-Machine. Poor product reviews were used as mild negative brand extension information, and serious product recalls were used as severe negative brand extension information.

Discussion of Results

Although prior research in which consumers received negative information about a brand extension has generally shown only limited dilution to overall brand attitude (Keller and Aaker 1992) and brand beliefs (Loken and John 1993; Romeo 1991), this research found significant attitude change between before and after the respondents were exposed to the negative brand extension information. Reciprocal effects of negative information of brand extension to the parent brands were found in both studies and across two different products. The significant finding might have been due to the detailed information of brand and extension, and the negative information provided to the subjects. One limitation of previous studies was the small amount of information provided to subjects about the parent brand. In general, subjects have been told only the name of the extending brand and the product category of the new product, and then asked to form evaluations about this extension. The lack of detailed descriptive information about the extension may have resulted in subjects being fairly uninvolved and uninterested in the task (Viswanathan 1997). This low involvement may have contributed to the insignificant reciprocal effects findings of previous studies. In order to increase consumers' involvement, this research gave respondents more elaborated information about both the brand and the extension. Therefore respondents were more involved with the task and engaged in processing relevant information. As expected, significant effect of negative brand extension information on parent brand evaluation was found.

Brand Extension Fit

Research results indicated that attitude toward parent brand was significantly diluted by negative brand extension information, regardless of the category fit of brand extension. In other words, the level of category fit between the parent brand and the brand extension did not have a significant impact on the reciprocal effect of negative brand extension information. This finding is consistent with some of the past studies examining how an unsuccessful or unfavorable brand extension dilutes its parent brand. Loken and John's (1993) and John, Loken, and Joiner's (1998) research revealed that dilution effects on brand beliefs do emerge when brand extension attributes are inconsistent with the family brand, *regardless of the category similarity of brand extensions*. While Keller and Aaker (1992) concluded that the core brand image is not affected by unsuccessful brand extensions, they still found that the level of how the brand extensions are perceived as typical of the core brand did not have a differential impact, either.

However, the findings about brand extension category fit were not consistent with the prediction made previously by the Mandler's Schema Congruity Model. Mandler's model suggests that individual's existing schema serves as a frame of reference and guides specific types of internal processes operating in response to different levels of incongruity. Negative information of a brand extension of *same* product category could be considered as moderately incongruent information and thus should be assimilated with existing schema by necessary and reasonable modifications. While negative information

of a brand extension of a different product category, considered severely incongruent information, should be filtered out from existing schema and encoded as a separate case. Therefore, high (vs. low) category fit brand extension should have a more significant influence on the attitude change of parent brand before and after the revelation of the negative information of brand extension.

There are two possible explanations for this insignificant finding. One reason might be due to the lack of difference of level of fit between brand extensions. The research intended to investigate the reciprocal effect caused by negative information rather than that caused by dissimilarity between the brand and the extensions. Thus, when choosing brand extensions, extremely dissimilar brand extensions were intentionally dismissed as to avoid introducing reciprocal effect cause by unfit brand extensions. Therefore, although the levels of fit of the brand extension are statistically different, they might still fall under the moderate fit category.

Therefore, to state the findings about brand extension fit from this research more precisely: if the association between the brand and the brand extension is strongly established, and there are no extremely unfit links between the brand and the brand extension, the relative variations of level of fit between the parent brand and the brand extension will not have a significant differential effect on the evaluation of the parent brand. Under this condition, the respondents can assimilate negative information and adjust their attitude to the parent brand accordingly; no negative information is rejected as too incongruent, and thus separated from the original schema.

Research by Ahlumalia and Gurhan-Canli (2000) also shed some light as to explain the non-significant findings of brand extension fit. Their findings indicate that the results of the dilution effects rely on the information accessibility of brand extensions. Under higher accessibility, negative information about the extension leads to dilution of brand name. While under lower accessibility, only negative information about a close (vs. far) extension leads to dilution of brand name. Because this research provided detailed information about the brand and the brand extension while asking the respondents to evaluate the brand, the readily available information had high accessibility. As a result, under this condition, negative information about the extension led to negative reciprocal effects on the extension regardless of the category fit of the brand extension and the brand.

Information Negativity

Research results indicated that the level of information negativity significantly influenced the effect of negative extension information on customer attitudes to parent brand. However, the direction of the vector is opposite to the hypothesis. The hypothesis based on Mandler's schema congruity model suggested that when severe negative information about the brand extension is exposed to respondents, the impact would be smaller than when consumers are exposed to mild negative information about the brand extension. The logic is that severe negative information is viewed as more incongruent with the schema, and might be rejected as temporal or unrelated, therefore the severe

negative information is established as a subtype and separated from the existing schema. However, in this research, severe negative information is found to lead to more attitude change, whereas mild negative information leads to less attitude change. Severe negative information used in this research is product recalls, which involved serious body injuries caused by the product and potential future shock or electrocution hazard, were still assimilated with the existing schema, rather than isolated into a separate sub-category.

One explanation of this unexpected finding might be due to the use of fictitious brand. Although large amounts of information about the brand and brand extension was presented to subjects, attitudes toward the brand were formed shortly before the introduction of negative information. Even with the intervening task that removed the carryover effect of the brand attitude, the short lived attitude was likely to be easily changed by subsequent negative information.

Another possible explanation might be due to an interaction effect between brand extension fit and information negativity. Specifically, when brand extension fit is high, the impact of severe negative information is bigger than that of mild negative information. On the contrary, when brand extension fit is considerably low, that is, when there is not enough explanatory links established between the brand and its extension, the impact of mild negative information might be larger than the impact of severe negative information.

As mentioned previously, the brand extension in the research did not reach to an extremely dissimilar level, the brand and the brand extension still have basis for

associations other than the brand name alone. Negative information of the brand extension could not be isolated from the original brand schema just because of the severity of the negative information. Hence, mild negative information would have a less significant effect than severe negative information on consumer's attitude toward original brands. Because both are assimilated to the original brand schema, severe negative information might require more effort and more adjustments to maintain consistency across the links within the schema, and thus consequently would have a stronger influence on the attitude to parent brand. Thus, for highly to moderately consistent brand extensions, severe negative information of brand extension causes more negative customers' attitude change toward the parent brand. It is speculated that when the brand extensions are extremely different, and/or the negative information is extremely severe, subjects might have difficulty assimilating the extremely discrepant information with existing brand schema. They might ascribe the cause of the negative information either to difficulty of transferring the company's capability to the new brand extension, or to factors beyond the brand's control. Therefore, the negative extension information would not have a severe effect on the brand attitude. Although this research failed to identify the sub-typing effect of negative brand extension, it is still hoped that by including extremely negative information, and extremely unfit brand extension, this effect can be revealed by future research.

Overall, the findings about information negativity helped to clarify how the congruency of the information influences consumers' evaluation of additional

information of a brand extension. The findings suggest that the severity of the negative information is one of the determinants of the congruency between brand extension information and parent brand schema. Furthermore, the severity of the negative information of brand extension significantly influences its reciprocal effect on parent brand.

Association Set Size

As predicted by the corresponding hypothesis, the research results illustrated that association set size of parent brand was a significant factor moderating negative brand extension's reciprocal effect on parent brand. When consumers have a large association set with the parent brand, they have a greater number of associations with the brand. Interference will be more pronounced for brand names with large association sets, because a greater number of diverse associations might interfere with the activation of specific links. Thus, the interfering effect of other activated related nodes reduces the chance and intensity of the negative information to be processed. So, the detrimental effect of the negative information on parent brand is small. However, when consumers have a smaller association set with the brand, they do not have many associated nodes to be activated and interfere with the processing of the negative information, and therefore, the effect of negative information is large.

This finding is crucial in that negative information about a brand extension will be more problematic for the parent brand when consumers have scant association sets, or

knowledge structures for parent brand. The negative reciprocal effect of brand extension caused by negative information can be limited if consumers already have a large set of positive associations with the parent brand. Consumers' rich and varied cognitive structures of the brand can insulate the brand from negative press. It might not necessarily indicate that negative information about a brand extension cause serious harm to an established brand. This finding is consistent with other research findings which suggest that brands for which consumers have higher commitment and stronger associations are more resistant to negative publicity (Ahluwalia et al. 2000) and product harm crises (Dawar and Pillutla 2000).

Results showed that there were no major differences between student and non-student groups. Significant difference between respondents' original attitudes toward the brand and their attitudes to the brand after exposure to negative information related to the brand was found both in student and consumer groups. Also, for both student and consumer groups, significant effects of perceived negativity of the extension information and association set size on attitude change toward the parent brand were found. However, for the effect of brand extension fit on attitude change, consumer group found significant relationship only for low-involvement product category, whereas for student group, non-significant results were found for both low- and high-involvement product categories.

Implications of the Study

Negative information in marketing communication is a dangerous phenomenon,

because it can affect every aspect of a company from its image, employees' morale to sales and profitability. Despite increased prominence of negative information in the marketplace, knowledge about the impact of negative messages on consumers is very limited. On the other hand, brand extension is a popular business strategy for company growth and market penetration. Yet, the impact of brand extension negative information to parent brand attitude is not yet clear. A few previous researches even suggested that there was no significant relationship between negative extension information and the evaluation of parent brand although both schema theory and category theory suggested potential linkage. This dissertation focused on how negative information of brand extension impacts the parent brand. Specifically, it endeavored to fill the research gap by `examining the issue of how negative information of brand extension affect the parent brand and improve the understanding of the process by which negative information of brand extensions that cause parent brand dilution, i.e. decrease the consumers' favorable attitude towards the parent brand. There are several implications of this study.

In general, the significant impact of negative information on parent brand evaluation has been enlightened by this research. This significant finding supplemented the previous findings with the improved experimental design and more details provided of parent brand and brand extensions. This finding is an important addition to brand extension research suggesting a significant relationship between negative brand extension information and the evaluation of parent brand. This sends a message to brand managers who are facing a proliferation of brand extensions that the potential of getting involved

with negative extension information increases chances of the parent brand damages. Corporations should carefully manage new brand extensions, and thus, reduce the potential damage to the established original brand.

Second, there are no studies that have evaluated the role of severity of negative information in the context of brand extension before. This research extended the application of schema theory to brand extension from merely conceptualizing the congruity in terms of perceived fit between parent brand and brand extensions to the congruity influenced by the severity of negative information. In other words, the strength of the link between the negative extension information and the parent brand is influenced both by the perceived fit between the parent brand and the extension and the perceived severity of the negative information. Research findings indicate that severity of negative information is a significant moderator for the relationship between brand extension negative information and consumers' attitude toward parent brand. This significant finding has great implication for negative information research since severity of information has always been overlooked as an important dimension. It provides new revenue for negative extension information research.

The findings about negativity of brand extension information also have important managerial implications. Depending on the level of severity of the information, consumers would take different routes for information processing, and thus generate different consequences to the brand attitudes. Thus, the estimation of the damage to brand equity of the parent brand also would depend on both the severity of brand extension

negative information and the fit between the brand and the extension. Also it implies that facing different level of severity, the company might need to use different methods and technique to respond to negative information.

Third, the association set size is another newly introduced concept to brand extension research. This variable reflects the conflicting and interfering effects by other associative nodes of a concept. The more nodes associated with the brand, the less likely one specific node will have a great impact on the overall evaluation of the concept because all activated nodes will compete for attention and processing capacity. The significant findings related with association set size of the brand also provide significant practical implications. It suggested that if the consumers already have a large set of well-defined association with the brand, then negative information would not hurt the brand to a large extent. It implies that company should engage in precautious activities, which means even before actually encountering any possible negative information, the company should try to create and manage a positive and extensive association network with the brand. High brand equity probably will shield the company from future negative information.

Fourth, another significance of this study involves methodological issues. Several of the previous reciprocity studies on brand extension have methodological limitations. In particular, one limitation of the previous studies is the amount of information provided to subjects about the parent brand. In general, subjects have been told only the name of the extending brand and the product category of the new product, and then asked to form

evaluations about this extension. The lack of more complete descriptive information about the extension may have resulted in subjects being fairly uninvolved and uninterested in the task (Viswanathan 1997). This low involvement may have contributed to the insignificant reciprocal effects findings. Therefore, this dissertation avoids this limitation by varying the involvement level with the product category when designing for product replicates, and providing an expanded brand and extension description to subjects. Another methodological issue is that some prior research uses real brand name in the experiment. Because the real brand name may result in strong and highly accessible attitudes towards the parent brand, the newly introduced limited negative information might not be strong enough to lead to any changes in consumers' attitudes. This research overcomes this methodological limitation by using fictitious brands and providing extensive information about the brand.

Study Limitations

As with most studies, there were several limitations in this research.

First, several characteristics of the study itself limit the generalizability of the results. This research did not use extremely unfit brand extensions to test the hypotheses as to avoid introducing confounding effect caused by unfit extensions other than by negative information. This manipulation might be a causing factor for the insignificant findings about brand extension fit and information negativity. In addition, although the experimental design allows one to control factors which might confound the study's

results, it leads to an artificial environment that does not reflect the actual process used by consumers to evaluate brand extensions. To control for factors other than brand extension fit, extension information negativity, association set size of parent brand, the stimuli were specifically designed. In reality, consumers may use other information when forming their judgments. Future research should examine the role that other information such as advertising, packaging, and product experience plays in influencing the reciprocal effects. The study also utilized fictitious brand names in two product categories. Future studies should examine negative reciprocal effects for real brands in other product categories. For instance, would these same results apply to real brands? Would these results apply to very dissimilar brand extensions? Future studies may find that extension fit may actually influence on the attitude change if the effect of negative information and effect of unfitting brand extensions can be separated.

One factor is the compressed time in which the phenomenon was examined. Each complete experiment, which involved learning about the brand, developing the association between the brand and brand extension, and reacting to exposure to the negative information, was done in 35 to 45 minutes. In the marketplace, the process would occur over weeks, if not years.

Another limitation of this research is the use of fictitious brand because the difficulties of identifying specific scenarios of real brands. Results from the experiments could at the limit be generalized to the subset of new or relatively unknown brands for which consumers' knowledge structures are scant. The use of fictitious brands structured

a situation in which the negative information was essentially one important ground on which subjects could form evaluations of the brand. Further, because negative information is notable in its tendency to gain attention and evoke cognitive effort, the experiments created a best environment for the negativity information to be integrated with initial attitudes formed toward the brand and therefore to result in less favorable attitude.

Another limitation of this research is the selection of brand extensions. Since the brand extensions selected were not very distant from the parent brand. The potential effect of sub-typing model was not found. The reason for failure to identify this effect probably lies in the conditions that brand extensions are still fit with the parent brand, thus established a good-enough explanationary linkage between the negative information and the schema of the parent brand.

Future Research

This research only focused on the investigation of negative information. Since negative information tends to be more obvious and stands out compared with positive information, it is also interesting to compare the effect of negative effects and positive effects, and also sometimes, it is still possible to compare the repetition of additional information to see the corresponding changes. Future studies should explore positive reciprocal effects in more detail by exploring conditions under which positive reciprocal effects are most likely to occur. It may be that these additional positive reciprocal effects

only occur after several exposures to the extension as opposed to a singe exposure. Future research can compare the effect of positive information and negative information on the strength of existing associations or attitudes toward the brand. Thus, future research should consider the effect of repetitive exposure to the extension in order for positive effects to be realized. In addition, other factors, such as advertising, which help consumers understand why the extension is being introduced, may improve the likelihood of positive reciprocal effects even when the extension fits poorly with the parent brand in some way.

This research makes the assumption that how the company reacts and handles with the negative information remains constant. However, the follow-up attitude and actions of the company might have a significant effect on how consumers evaluate on the brand extension, and the brand in general. Thus, another good research topic is the handling of negative information's impact on consumers' attitude to the parent brand.

There is the possibility of expanding dependent variables to consumers' behavioral responses. This research limited the effect of negative information with consumers' attitudinal responses. The ultimate goal for brand communication, however, is to help increase the sales volume. Therefore, it will be beneficial to be able to test the effects of negative brand information on consumers' buying intention of the brands' original products and other products. According to the hierarchy of effect model, a strong linage between attitudes and behaviors was assumed. However, testing its relationship empirically will strengthen its relationship.

Another possible research topic on the effects of negative information is human memory. In advertising terminology, it is “wear-out”. This research only investigated the effect of negative information immediately after the subjects were exposed of the negative information. Overtime, the negative effect might diminish over time. An interesting research might be investigating the effect of the “wear out” of the negative impact of the reciprocal effect.

This research only used category fit as the manipulation of different types and levels of brand extension fit. Future research can consider different types of brand extension conceptualization, such as image fit, attribute fit. The more dimensions of fit between the parent brand and the brand extension help improve understand of the brand extension fit and the reciprocal effects of negative information of brand extensions.

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APPENDIX A

PRETEST QUESTIONNAIRE

Pretest 1

The purpose of this study is to explore people's consumption behavior and product usages. Please list products that you frequently use. Thanks a lot for participating.

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8 ._____

9._____

10._____

11._____

12._____

13._____

14._____

15._____

16._____

17._____

18._____

19._____

Pretest 2.

The purpose of this study is to explore people's consumption behavior and product usages. Please circle a number that best reflect your personal experience. Thanks a lot for participating.

Computer	very familiar	5	4	3	2	1	very unfamiliar
MP3 Players	very familiar	5	4	3	2	1	very unfamiliar
Toothpaste	very familiar	5	4	3	2	1	very unfamiliar
Deodorant	very familiar	5	4	3	2	1	very unfamiliar
Television set	very familiar	5	4	3	2	1	very unfamiliar
Soda drinks	very familiar	5	4	3	2	1	very unfamiliar
Lotion	very familiar	5	4	3	2	1	very unfamiliar
Shampoo	very familiar	5	4	3	2	1	very unfamiliar
Cleanser	very familiar	5	4	3	2	1	very unfamiliar
Scanner	very familiar	5	4	3	2	1	very unfamiliar

Pretest 3. This study is to examine the involvement of consumers with different product. Please circle the number you feel that best reflects your personal opninion.

I feel that toothpaste (is) _____ to me.

Very important	1	2	3	4	5	6	7	very unimportant
Of concern	1	2	3	4	5	6	7	not of concern
Irrelevant	1	2	3	4	5	6	7	relevant
Wanted	1	2	3	4	5	6	7	unwanted
Means a lot	1	2	3	4	5	6	7	means nothing

I feel that dental flosser (is) _____ to me.

Very important	1	2	3	4	5	6	7	very unimportant
Of concern	1	2	3	4	5	6	7	not of concern
Irrelevant	1	2	3	4	5	6	7	relevant
Wanted	1	2	3	4	5	6	7	unwanted
Means a lot	1	2	3	4	5	6	7	means nothing

I feel that television (is) _____ to me.

Very familiar		1	2	3	4	5	6	7 very unfamiliar
Very important	1	2	3	4	5	6	7	very unimportant
Of concern	1	2	3	4	5	6	7	not of concern
Irrelevant	1	2	3	4	5	6	7	relevant
Wanted	1	2	3	4	5	6	7	unwanted
Means a lot	1	2	3	4	5	6	7	means nothing

I feel that laptop (is) _____ to me.

Very important	1	2	3	4	5	6	7	very unimportant
Of concern	1	2	3	4	5	6	7	not of concern
Irrelevant	1	2	3	4	5	6	7	relevant
Wanted	1	2	3	4	5	6	7	unwanted
Means a lot	1	2	3	4	5	6	7	means nothing

I feel that toothbrush (is) _____ to me.

Very important	1	2	3	4	5	6	7	very unimportant
Of concern	1	2	3	4	5	6	7	not of concern
Irrelevant	1	2	3	4	5	6	7	relevant
Wanted	1	2	3	4	5	6	7	unwanted

Means a lot	1	2	3	4	5	6	7 means nothing

I feel that laptop computer (is) _____ to me.

Very important	1	2	3	4	5	6	7 very unimportant
Of concern	1	2	3	4	5	6	7 not of concern
Irrelevant	1	2	3	4	5	6	7 relevant
Wanted	1	2	3	4	5	6	7 unwanted
Means a lot	1	2	3	4	5	6	7 means nothing

I feel that desktop computer (is) _____ to me.

Very important	1	2	3	4	5	6	7 very unimportant
Of concern	1	2	3	4	5	6	7 not of concern
Irrelevant	1	2	3	4	5	6	7 relevant
Wanted	1	2	3	4	5	6	7 unwanted
Means a lot	1	2	3	4	5	6	7 means nothing

Pretest 4. This study is concerned with consumers' perception of appropriate fit between different product. Please compare the two products described in each question, and circle the number that you feel best represent your personal opinion.

1. I feel that laptop computers are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

2. I feel that laptop computers are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

3. I feel that DVD players are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

4. I feel that rear projection televisions are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

5. I feel that laptop computers are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

6. I feel that plasma televisions are _____ desktop computers.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with

unrepresentative of 1 2 3 4 5 6 7 representative of

7. I feel that VCRs are _____ desktop computers.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

8. I feel that electronic toothbrushes are _____ toothpastes.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

9.I feel that tooth whiting products are _____ toothpaste.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

10. I feel that electronic dental flosses are _____ toothpaste.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

11. I feel that canker sore pain relievers are _____ toothpaste.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

12. I feel that electric dental flossers are _____ toothpaste.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with
unrepresentative of 1 2 3 4 5 6 7 representative of

13. I feel that electric dental flossers are _____ manual toothbrush.
Similar to 1 2 3 4 5 6 7 not similar to
consistent with 1 2 3 4 5 6 7 inconsistent with

unrepresentative of	1	2	3	4	5	6	7	representative of

14. I feel that mouth rinse is _____ toothpaste.

Similar to	1	2	3	4	5	6	7	not similar to
consistent with	1	2	3	4	5	6	7	inconsistent with
unrepresentative of	1	2	3	4	5	6	7	representative of

15. I feel that battery-powered toothbrushes are _____ manual toothbrushes.

Similar to	1	2	3	4	5	6	7	not similar to
consistent with	1	2	3	4	5	6	7	inconsistent with
unrepresentative of	1	2	3	4	5	6	7	representative of

16. I feel that tongue cleaners are _____ toothpaste.

Similar to	1	2	3	4	5	6	7	not similar to
consistent with	1	2	3	4	5	6	7	inconsistent with
unrepresentative of	1	2	3	4	5	6	7	representative of

Pretest 5. The study is concerned with consumers' perception of the level of severity of negative information. You are going to read several news stories giving negative information about a product. Please read the stories carefully, and choose a number that most appropriately represent your opinion.

In order to provide an objective view of the electric flosser market, ten battery powered Dental Flossers are tested for ease of use and effectiveness, and are separated into "The Best" and "The Rest" categories by a panel of three dentists. The dentists test these electric dental flossers for action, size and shape, along with ease of use. Then twenty-four users who had never used an electric dental flosser before test them for cleaning ability and ease of use. The CompleteTeeth 3000 dental flosser is ranked as 5th out of ten and it's the noisiest model.

I feel the above information about the CompleteTeeth 3000 dental flosser is _____ to me.

not negative	1	2	3	4	5	6	7	very negative

serious	1	2	3	4	5	6	7	not serious
important	1	2	3	4	5	6	7	not important

WASHINGTON, D.C. - In cooperation with the U.S. Consumer Product Safety Commission (CPSC), the I-Machine, is announcing the voluntary recall of about 3,400 Series 4400 laptop computers.

I-Machine laptop computers has been sold in consumer electronic stores, department stores, and mass merchandisers nationwide from April 21, 2003 through May 8, 2003 for between $99 and $400.

If the capacitors short circuit due to a very high electrical surge, such as from a lightening strike, the metal parts on the laptop computer could present a shock or electrocution hazard. In addition, the metal jacks on the back of the laptop computers or another metal box attached to the laptop computers could present a shock or electrocution hazard as a result of the capacitors' failure. I-Machine has received consumer reports of five fires in the laptop computers. No injuries have been reported.

I feel the above information about the I-Machine laptop computers are _____ to me.

not negative	1	2	3	4	5	6	7	very negative
serious	1	2	3	4	5	6	7	not serious
important	1	2	3	4	5	6	7	not important

WASHINGTON, DC -- In cooperation with the U.S. Consumer Product Safety Commission (CPSC), CompleteTeeth, Inc., Moorestown, NJ, announced today that it is voluntarily recalling CompleteTeeth battery operated toothbrush (stock no. 2524).

Approximately 330,000 of these products were sold between 1986 and 1991 for up to $10.00 each. The toothbrushes were sold nationwide under the CompleteTeeth brand names through drugstore, variety and discount stores, and limited catalog mail-order sales.

The CompleteTeeth toothbrush uses four "AA" size batteries. If one of the batteries is inadvertently reversed, the battery may rupture or leak. CompleteTeeth has received three reports of minor burn injuries to children from leaking batteries and has learned from a news report that an exploding battery in this toothbrush may have caused serious eye injury to an adult. CompleteTeeth is recalling the toothbrush to eliminate the possibility

of any further incidents.

I feel the above information about CompleteTeeth battery operated toothbrush is _____ to me.

not negative	1	2	3	4	5	6	7	very negative
serious	1	2	3	4	5	6	7	not serious
important	1	2	3	4	5	6	7	not important

In order to provide an objective view of the laptop computer market, six panelists judge ten rear projection TVs in a thoroughly documented lab test. Plasmas, say editors, "have the edge in picture quality." The Pioneer PDP-5040HD is the top display, with the best color, brightness, contrast and features. The Mitsubishi PD-5030 ties for image quality, but not value—this model doesn't include speakers or a stand. The Panasonic TH-50PX25U/P is the best value, with an included HD tuner, speakers, and a cableCARD slot, along with strong performance. I-Machine 3000 plasma television is ranked as 5th out of ten for overall evaluation and it has problem of slight motion lag detected on low contrast.

I feel the above information about I-Machine 3000 plasma television is _____ to me.

not negative	1	2	3	4	5	6	7	very negative
serious	1	2	3	4	5	6	7	not serious
important	1	2	3	4	5	6	7	not important

APPENDIX B

SCENARIOS

1. CompleteTeeth Brief Description

Founded in 1950 in England, CompleteTeeth started with an innovative formula of toothpaste. The new formula included plant extracts that enhanced the cleaning effectiveness and added a pleasant flavor to toothpaste. Although CompleteTeeth is not a leading consumer products company, it shares the reputation of being innovative and deeply committed to advancing technology which can address changing consumer needs. Over the past 50 years, CompleteTeeth has been expanded from a single product to an extensive product family. Now they have 24 varieties of toothpaste.

Of all the varieties, two formulas from CompleteTeeth are standouts in reviews for toothpaste in 2004. Their innovative and customized designs cater to the customers needs and their emphasis on quality earned a lot trust and favor from consumers. Their market share has been doubled in ten years. CompleteTeeth does not limit the scope of their business to toothpastes. They view themselves as one manufacturer who provides a complete line of oral care products. Therefore, they also offer toothbrushes, dental floss, teeth whitening products and mouth rinse.

2. CompleteTeeth Detailed Description

Founded in 1950 in England, CompleteTeeth started with an innovative formula of toothpaste. The new formula included plant extracts that enhanced the cleaning effectiveness and added a pleasant flavor to toothpaste. It all started with a dentist, Dr. Robert Smith, who created the first CompleteTeeth toothpaste. Although CompleteTeeth is not a leading consumer products company, it shares the reputation of being innovative and deeply committed to advancing technology which can address changing consumer needs. In fact, the company's goal is to use the technology to create products that will continue to improve the quality of oral care for their consumers.

Over the past 50 years, CompleteTeeth has been expanded from a single product to an extensive product family. Now they have 24 varieties of toothpaste. For example, they have CompleteTeeth whitening to help maintain whiter smile and whiten while brushing, Complete Tartar protection to fight tartar and control plaque, CompleteTeeth sensitivity Protection specially formulated for protecting sensitive teeth and CompleteTeeth Cavity Protection for protecting cavity. They also have a family of toothpaste flavors to suit every taste. From Cinnamon to mint to citrus, there are more than a dozen choices. Besides, the toothpaste takes different forms from gels, liquid gels, pastes and striped toothpaste.

Of all the varieties, two formulas from CompleteTeeth are standouts in reviews for toothpaste in 2004: CompleteTeeth Total is recommended by the most experts for its unique antibacterial properties, and CompleteTeeth Baking Soda and Peroxide wins over thirty-eight other toothpastes in a side-by-side cleaning test. Their innovative and customized designs cater to the customers needs and their emphasis on quality earned a lot trust and favor from consumers. Their market share has been doubled in ten years.

CompleteTeeth does not limit the scope of their business to toothpastes. They view themselves as one manufacturer who provides a complete line of oral care products. Therefore, they also offer toothbrushes, dental floss, teeth whitening products and mouth rinse.

3. CompleteTeeth Electric Toothbrush Severe Negative Information

CompleteTeeth Recalls CompeleteTeeth Battery-Powered Toothbrush

WASHINGTON, DC -- In cooperation with the U.S. Consumer Product Safety Commission (CPSC), CompleteTeeth, Inc., Moorestown, NJ, announced today that it is voluntarily recalling CompleteTeeth battery operated toothbrush (stock no. 2524).

Approximately 330,000 of these products were sold between 1986 and 1991 for up to $10.00 each. The toothbrushes were sold nationwide under the CompleteTeeth brand names through drugstore, variety and discount stores, and limited catalog mail-order sales.

The CompleteTeeth toothbrush uses four "AA" size batteries. If one of the batteries is inadvertently reversed, the battery may rupture or leak. CompleteTeeth has received three reports of minor burn injuries to children from leaking batteries and has learned from a news report that an exploding battery in this toothbrush may have caused serious eye injury to an adult. CompleteTeeth is recalling the toothbrush to eliminate the possibility of any further incidents.

4. CompleteTeeth Electric Toothbrush Mild Negative Information

Electric Toothbrushes Reviews By Consumer Reports

Consumer Reports is published by Consumers Union, an expert, independent nonprofit organization whose mission is to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves. Therefore, the reports they provide is rated as very objective and reliable.

In order to provide an objective view of the electric toothbrush market, ten battery powered toothbrushes are tested for ease of use and effectiveness, and are separated into "The Best" and "The Rest" categories by a panel of three dentists. The dentists test these electric toothbrushes for bristles, head action, size and shape, along with ease of use. Then twenty-four users who had never used an electric toothbrush before test them for cleaning ability and ease of use. The CompleteTeeth 3000 toothbrush is ranked as 5th out

of ten and it's the noisiest model.
5. CompleteTeeth Electric Dental Flosser Severe Negative Information

CompleteTeeth Recalls CompeleteTeeth Battery-Powered Dental Flosser

WASHINGTON, DC -- In cooperation with the U.S. Consumer Product Safety Commission (CPSC), CompleteTeeth, Inc., Moorestown, NJ, announced today that it is voluntarily recalling CompleteTeeth battery operated flosser (stock no. 2524).

Approximately 330,000 of these products were sold between 1986 and 1991 for up to $10.00 each. The flossers were sold nationwide under the CompleteTeeth brand names through drugstore, variety and discount stores, and limited catalog mail-order sales.

The CompleteTeeth flossers uses four "AA" size batteries. If one of the batteries is inadvertently reversed, the battery may rupture or leak. CompleteTeeth has received three reports of minor burn injuries to children from leaking batteries and has learned from a news report that an exploding battery in this flosser may have caused serious eye injury to an adult. CompleteTeeth is recalling the floss to eliminate the possibility of any further incidents.

6. CompleteTeeth Electric Dental Flosser Mild Negative Information

Electric Dental Flosser Reviews By Consumer Reports

Consumer Reports is published by Consumers Union, an expert, independent nonprofit organization whose mission is to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves. Therefore, the reports they provide is rated as very objective and reliable.

In order to provide an objective view of the electric flosser market, ten battery powered Dental Flosses are tested for ease of use and effectiveness, and are separated into "The Best" and "The Rest" categories by a panel of three dentists. The dentists test

these electric dental flosses for action, size and shape, along with ease of use. Then twenty-four users who had never used an electric dental flosser before test them for cleaning ability and ease of use. The CompleteTeeth 3000 dental flosser is ranked as 5th out of ten and it's the noisiest model.

7. I-Machine Brief Description

I-Machine is one of the leading computer company in U.S. They design, build and customize products and services to satisfy a range of customer requirements. I-Machine was founded in 1985 with an innovative product line of stylish and quality desktop computers. Although the company is new in the market, it is climbing to market leadership due to its persistent focus on the customer.

At I-Machine, they are committed to building value not only for the customers and their business, but also for the communities that the company and their employees call home. They strive to participate responsibly in the global marketplace in which they operate.

I-Machine does not limit their business to computers. Relying on their innovative technology strength and personnel, they also offer other computer peripheral products and electronics products.

8. I-Machine Detailed Description

I-Machine is one of the leading computer company in U.S. They design, build and customize products and services to satisfy a range of customer requirements. They do business directly with customers, one at a time.

I-Machine was founded in 1985 with an innovative product line of stylish and quality desktop computers. Although the company is new in the market, it is climbing to market leadership due to its persistent focus on the customer. The I-Machine team works hard to meet the needs of each customer with carefully tailored standards-based computing solutions. They communicate directly with the customers, in person, via the internet or by phone, so their understanding of the cutomers' needs is instantaneous. It enables them to effectively and efficiently deliver world-class products and services that keep customers coming back.

I-Machine enjoys good reputation for offering quality products and responsive service. In a rent survey by an consumer organization for computer products, I-Machine is one of the well-accepted and trusted brand.

I-Machine relies on the diversity of its personnel, suppliers, and customers communities to maximize innovation, growth, competitiveness, and customer satisfaction. The diversity programs help them build a barrier free workplace and the same barrier free phiolosophy is also applied to the supplier relationships through the supplier diversity programs.

I-Machine is committed to a culture of environmental sustainability and responsibility. They continually reduce their impact on the environment thorough product design, manufacturing and operations, product ownership experience, and product end-of-life solutions.

I-Machine does not limit their business to computers. Relying on their innovative technology strength and personnel, they also offer other computer peripheral products and electronics products.

9. I-Machine Laptop computer Severe Negative Information

CPSC and I-Machine Announce Recall of Laptop computer

WASHINGTON, D.C. - In cooperation with the U.S. Consumer Product Safety Commission (CPSC), the I-Machine, is announcing the voluntary recall of about 3,400 Series 4400 laptop computer.

I-Machine rear projection televisions has been sold in consumer electronic stores, department stores, and mass merchandisers nationwide from April 21, 2003 through May 8, 2003 for between $99 and $400.

If the capacitors short circuit due to a very high electrical surge, such as from a lightening strike, the metal parts on the laptop computer could present a shock or electrocution hazard. In addition, the metal jacks on the back of the television or another metal box attached to the television could present a shock or electrocution hazard as a result of the capacitors' failure. I-Machine has received consumer reports of five fires in the laptop computers. No injuries have been reported.

10. I-Machine Laptop computer Mild Negative Information

Laptop computer Reviews By Consumer Reports

Consumer Reports is published by Consumers Union, an expert, independent nonprofit organization whose mission is to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves. Therefore, the reports they provide is rated as very objective and reliable.

In order to provide an objective view of the laptop computer market, six panelists judge ten laptop computers in a thoroughly documented lab test. The Epson 4180 is ranked as best for its higher resolution (4800 x 9600 dpi), excellent one-click color restoration, its state-of-the-art image enhancement and its ability to batch-scan 35mm slides. CanoScan 9900F gets the second highest overall scores; transparency and negative film scans were better than others. However, the Epson Perfection 4870 does a better job with color photos. I-Machine 3000 laptop computer is ranked as 5th out of ten for overall evaluation and its auto dust brush is not as efficient as a comparable feature in similar-priced models.

11. I-Machine Plasma Television Severe Negative Information

CPSC and I-Machine Announce Recall of Rear Projection Televisions

WASHINGTON, D.C. - In cooperation with the U.S. Consumer Product Safety Commission (CPSC), the I-Machine, is announcing the voluntary recall of about 3,400 Series 4400 rear projection televisions.

I-Machine rear projection televisions has been sold in consumer electronic stores, department stores, and mass merchandisers nationwide from April 21, 2003 through May 8, 2003 for between $999 and $2200.

If the capacitors short circuit due to a very high electrical surge, such as from a lightening strike, the metal parts on the television could present a shock or electrocution hazard. In addition, the metal jacks on the back of the television or another metal box attached to the television could present a shock or electrocution hazard as a result of the capacitors' failure. I-Machine has received consumer reports of five fires in the television sets. No injuries have been reported.

12. I-Machine Plasma Television Mild Negative Information

Plasma Television Reviews By Consumer Reports

Consumer Reports is published by Consumers Union, an expert, independent nonprofit organization whose mission is to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves. Therefore, the reports they provide is rated as very objective and reliable.

In order to provide an objective view of the rear projection television market, six panelists judge ten rear projection TVs in a thoroughly documented lab test. Plasmas, say editors, "have the edge in picture quality." The Pioneer PDP-5040HD is the top display, with the best color, brightness, contrast and features. The Mitsubishi PD-5030 ties for

image quality, but not value—this model doesn't include speakers or a stand. The Panasonic TH-50PX25U/P is the best value, with an included HD tuner, speakers, and a cableCARD slot, along with strong performance. I-Machine 3000 plasma television ranked as 5th out of ten for overall evaluation and it has problem of slight motion lag detected on low contrast.

APPENDIX C

SAMPLE EXPERIMENT STIMULUS

Informed Consent

Thank you for agreeing to participate in our research study. The purpose of this study is to better understand how people process information. We are examining whether a person's involvement in products will influence the way the information about the products are processed. In this study, you are going to read two case studies and will be asked your behavior and attitudes about the relevant products and brands.
There are no reasonably foreseeable risks or discomforts that might occur as a result of your participation in the study.
All information and answers you provide related to this study will be kept confidential. All data collected from individual participants will be destroyed after it has been statistically analyzed and the research purposes have been completed.

Your participation in this study is voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may refuse to answer any specific question. You may withdraw from participating in this study at any time. The time needed to participate in the entire study will be approximately thirty minutes. By signing below, you are indicating that you are willing to participate in this study under the terms and conditions described above.

Name (Print):_____ Date:_____
Signature:_____

Should you have any questions about this study, please contact the researchers below or the office of Regulatory Compliance at (662)325-4394 if you have questions about your rights as a research subject.
Sincerely,

Lin Zhang Ph.D. Student of Marketing College of Business & Industry Mississippi State University (662) 325-8261	Dr. Ron Taylor Professor of Marketing College of Business & industry Mississippi State University (662) 325-1953

Instructions:

1. Please read and follow the instructions carefully.
2. The objective of this exercise is to understand how people process information.
3. You will be given half an hour to go through two short cases and then answer questions based on material in the case. The total time available is 30 minutes, which should give you more than ample time to complete the exercise.
4. Please turn the page in the given order. Please do not look at the questions till you have finished reading the case.
5. Please be as sincere as possible in answering all questions.

Thank you for your participation

Please carefully read the following description about CompleteTeeth.

Founded in 1950 in England, CompleteTeeth started with an innovative formula of toothpaste. The new formula included plant extracts that enhanced the cleaning effectiveness and added a pleasant flavor to toothpaste. Although CompleteTeeth is not a leading consumer products company, it shares the reputation of being innovative and deeply committed to advancing technology which can address changing consumer needs. Over the past 50 years, CompleteTeeth has been expanded from a single product to an extensive product family. Now they have 24 varieties of toothpaste.

Of all the varieties, two formulas from CompleteTeeth are standouts in reviews for toothpaste in 2004. Their innovative and customized designs cater to the customers needs and their emphasis on quality earned a lot trust and favor from consumers. Their market share has been doubled in ten years. CompleteTeeth does not limit the scope of their business to toothpastes. They view themselves as one manufacturer who provides a complete line of oral care products. Therefore, they also offer toothbrushes, dental floss, teeth whitening products and mouth rinse.

Please think about the above information for a minute or so, and then turn the page to answer questions about CompleteTeeth.

A) Please answer each of the following questions by circle the appropriate number for each response.

1.Based on your reading **all the material** that was presented to you about CompleteTeeth, how would you describe your overall feelings toward **CompleteTeeth products**?

My overall feelings toward CompleteTeeth products are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very postive
Like very much	1	2	3	4	5	6	7 dislike very much

2)What is CompleteTeeth's major product?_____

3)Presently CompleteTeeth is planning to launch a new product: plasma television. Based on your knowledge of CompleteTeeth, please rate your expectation of the quality of this new product.

The new CompleteTeeth plasma television will be of

Very low quality	1	2	3	4	5	6	7 very high quality

Please carefully read the following description about I-Machine.

Case II

I-Machine is one of the leading computer company in U.S. They design, build and customize products and services to satisfy a range of customer requirements. They do business directly with customers, one at a time.

I-Machine was founded in 1985 with an innovative product line of stylish and quality desktop computers. Although the company is new in the market, it is climbing to market leadership due to its persistent focus on the customer. The I-Machine team works hard to meet the needs of each customer with carefully tailored standards-based computing solutions. They communicate directly with the customers, in person, via the internet or by phone, so their understanding of the cutomers' needs is instantaneous. It enables them to effectively and efficiently deliver world-class products and services that keep customers coming back.

I-Machine enjoys good reputation for offering quality products and responsive service. In a rent survey by an consumer organization for computer products, I-Machine is one of the well-accepted and trusted brand.

I-Machine relies on the diversity of its personnel, suppliers, and customers communities to maximize innovation, growth, competitiveness, and customer satisfaction. The diversity programs help them build a barrier free workplace and the same barrier free phiolosophy is also applied to the supplier relationships through the supplier diversity programs.

I-Machine is committed to a culture of environmental sustainability and responsibility. They continually reduce their impact on the environment thorough product design, manufacturing and operations, product ownership experience, and product end-of-life solutions.

I-Machine does not limit their business to computers. Relying on their innovative technology strength and personnel, they also offer other computer peripheral products and electronics products.

Please think about the above information for a minute or so, and then turn the page to answer questions about I-Machine.

4. Based on your reading **all the material** that was presented to you about I-Machine, how would you describe your overall feelings toward **I-Machine products**?

My overall feelings toward I-Machine products are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very positive
Like very much	1	2	3	4	5	6	7 dislike very much

5.What is I-Machine's major product?_____

6. Presently I-Machine is planning to launch a new product: plasma television. Based on your knowledge of I-Machine, please rate your expectation of the quality of this new product.

The new I-Machine plasma television will be of

Very low quality	1	2	3	4	5	6	7 very high quality

B) For each of the statement below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you), code in “1”; if the statement is extremely characteristic of you (very much like you), code in “5”. Code in a “2” if the statement is somewhat uncharacteristic of you; code in a “3” is you are uncertain; and code in a “4” if the statement is somewhat characteristic of you. The meaning of each rating is also illustrated in the following table.

1	Extremely uncharacteristic of me
2	Somewhat uncharacteristic of me
3	I am uncertain
4	Somewhat characteristic of me
5	Very much like me

Statement	**Ratings**
1. I prefer complex to simple problems.	
2. I like to have the responsibility of handling a situation that requires a lot of thinking.	
3. Thinking is not my idea of fun.	
4. I would rather do something that requires little thought rather than something that is sure to challenge my thinking abilities.	
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	
6. I find satisfaction in deliberating hard for long hours.	
7. I only think as hard as I have to	
8. I prefer to think about small daily projects to long term ones.	
9. I like tasks that require little thought once I’ve learned them.	
10. The idea of relying on though to make my way to the top appeals to me.	

11. I really enjoy a task that involves coming up with new solutions to problems.	
12. Learning new ways to think doesn't excite me very much.	
13. I prefer my life to be filled with puzzles that I must solve.	
14. The notion of thinking abstractly is appealing to me.	
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.	

C). We are interested in the thoughts that went through your mind as you read the information on I-Machine and on CompleteTeeth. In the lines below please list ALL thoughts/ideas/images that crossed your mind as you read the information. Please do not worry about grammar or punctuation.

I-Machine:

CompleteTeeth

Here is a recent new story about CompleteTeeth electric dental flossers. Please read it carefully.

Electric Dental Flosser Reviews By Consumer Reports

Consumer Reports is published by Consumers Union, an expert, independent nonprofit organization whose mission is to work for a fair, just, and safe marketplace for all consumers and to empower consumers to protect themselves. Therefore, the reports they provide is rated as very objective and reliable.

In order to provide an objective view of the electric flosser market, ten battery powered Dental Flosses are tested for ease of use and effectiveness, and are separated into "The Best" and "The Rest" categories by a panel of three dentists. The dentists test these electric dental flosses for action, size and shape, along with ease of use. Then twenty-four users who had never used an electric dental flosser before test them for cleaning ability and ease of use. The CompleteTeeth 3000 dental flosser is ranked as 5th out of ten and it's the noisiest model.

D).
1). I feel the above information about the CompleteTeeth 3000 dental floss is _____ to me.

not negative	1	2	3	4	5	6	7	very negative
serious	1	2	3	4	5	6	7	not serious
important	1	2	3	4	5	6	7	not important

2). I consider the source I ready the recent news to be

believable	1	2	3	4	5	6	7	not believable
trustworthy	1	2	3	4	5	6	7	not trustworthy
Unreliable	1	2	3	4	5	6	7	reliable
Informative	1	2	3	4	5	6	7	not informative

3).Based on the information provided to you about CompleteTeeth, how would you describe your perception of the fit between CompleteTeeth and it’s extension into electric dental floss? I feel that laptop computers are _____ CompleteTeeth products.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

4). My overall feelings toward CompleteTeeth products are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very postive
Like very much	1	2	3	4	5	6	7 dislike very much

5). My overall feelings toward CompleteTeeth 3000 dental floss are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very postive
Like very much	1	2	3	4	5	6	7 dislike very much

6). I feel dental care products are _____ to me.

Very familiar	1	2	3	4	5	6	7 very unfamiliar
Very important	1	2	3	4	5	6	7 very unimportant
Of concern	1	2	3	4	5	6	7 not of concern
Irrelevant	1	2	3	4	5	6	7 relevant
Wanted	1	2	3	4	5	6	7 unwanted
Means a lot	1	2	3	4	5	6	7 means nothing

Here is a recent new story about I-Mchine laptop computer. Please read it carefully.

Recent News

WASHINGTON, D.C. - In cooperation with the U.S. Consumer Product Safety Commission (CPSC), the I-Machine, is announcing the voluntary recall of about 3,400 Series 4400 laptop computer.

I-Machine rear projection televisions has been sold in consumer electronic stores, department stores, and mass merchandisers nationwide from April 21, 2003 through May 8, 2003 for between $99 and $400.

If the capacitors short circuit due to a very high electrical surge, such as from a lightening strike, the metal parts on the laptop computer could present a shock or electrocution hazard. In addition, the metal jacks on the back of the television or another metal box attached to the television could present a shock or electrocution hazard as a result of the capacitors' failure. I-Machine has received consumer reports of five fires in the laptop computers. No injuries have been reported.

E).
1). I feel the above information about the I-Machine 4400 laptop computer is _____ to me.

not negative	1	2	3	4	5	6	7 very negative
serious	1	2	3	4	5	6	7 not serious
important	1	2	3	4	5	6	7 not important

2). I consider the source I ready the recent news to be

believable	1	2	3	4	5	6	7 not believable
trustworthy	1	2	3	4	5	6	7 not trustworthy
Unreliable	1	2	3	4	5	6	7 reliable
Informative	1	2	3	4	5	6	7 not informative

3). Based on the information provided to you about I-Machine, how would you describe your perception of the fit between I-Machine and it's extension into laptop computer? I feel that laptop computers are _____ I-Machine products.

Similar to	1	2	3	4	5	6	7 not similar to
consistent with	1	2	3	4	5	6	7 inconsistent with
unrepresentative of	1	2	3	4	5	6	7 representative of

4). My overall feelings toward I-Machine products are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very postive
Like very much	1	2	3	4	5	6	7 dislike very much

5). My overall feelings toward I-Machine 4400 laptop computer are

Very good	1	2	3	4	5	6	7 very bad
Very unfavorable	1	2	3	4	5	6	7 very favorable
Very negative	1	2	3	4	5	6	7 very postive
Like very much	1	2	3	4	5	6	7 dislike very much

6). I feel dental computer-related products are _____ to me.

Very familiar	1	2	3	4	5	6	7 very unfamiliar
Very important	1	2	3	4	5	6	7 very unimportant
Of concern	1	2	3	4	5	6	7 not of concern
Irrelevant	1	2	3	4	5	6	7 relevant
Wanted	1	2	3	4	5	6	7 unwanted
Means a lot	1	2	3	4	5	6	7 means nothing

F).Tell your demographics (this will be used only for statistical purposes)
1. How old were you on your last birthday? Please type your exact age in years. ___

2. How would you describe your race/ethnicity?
a) White
b) African American
c) Hispanic
4) Asian American/Pacific Islander
5) American Indian
6) other

3. Which of the following categories is closest to your TOTAL HOUSEHOLD income for the past year? (If you are a student, please indicate your parents' total household income).
a) <= $10,000
b) $10,000 to $29,999
c) $30,000 to $59,999
d) $60,000 to $79,999
e) $80,000 to $99,999
f) >=$100,000

4. What is your gender?
a) female
b) male

APPENDIX D

STEM-AND–LEAF PLOTS

1. A prior attitude toward CompleteTeeth Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    18.00        1 .  00002222
     7.00        1 .  577
    58.00        2 .  00000000000022222222222222222
    41.00        2 .  55555555555577777777
    76.00        3 .  000000000000000222222222222222222222
    62.00        3 .  55555555555555555555777777777777
    56.00        4 .  00000000000000000000000002222
     8.00        4 .  557
    11.00        5 .  00022
     2.00        5 .  5
     6.00 Extremes    (>=5.8)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

2. A prior attitude toward E-machine Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    37.00        1 .  0000000000222222222
    21.00        1 .  5555577777
    83.00        2 .  00000000000000000000000022222222222222222222
    49.00        2 .  55555555555557777777777
    59.00        3 .  00000000000000022222222222222
    39.00        3 .  5555555555557777777
    42.00        4 .  000000000000000000222
    10.00        4 .  5557
     2.00        5 .  2
     3.00 Extremes    (>=5.8)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

3. Perceived fit between electronic toothbrush and CompleteTeeth Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    71.00        1 .  00000000000000000000000000003333333
    22.00        1 .  66666666666
    75.00        2 .  000000000000000000000000333333333333
    27.00        2 .  6666666666666
    61.00        3 .  0000000000000000333333333333
    18.00        3 .  666666666
    55.00        4 .  00000000000000000000033333
     2.00        4 .  6
     8.00        5 .  003
     2.00        5 .  6
     2.00        6 .  0
     2.00 Extremes    (>=7.0)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

4. Perceived fit between laptop computer and E-machine Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    78.00        1 .  000000000000000000000000000003333333
    12.00        1 .  666666
    77.00        2 .  000000000000000000000000033333333333
    28.00        2 .  66666666666666
    52.00        3 .  00000000000000333333333
    24.00        3 .  66666666666&
    51.00        4 .  00000000000000333333333
     8.00        4 .  6666
     8.00        5 .  0003
     1.00        5 .  &
     5.00        6 .  00&
     1.00 Extremes    (>=6.7)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

5. Perceived negativity of CompleteTeeth extension news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    46.00        1 .  00000000000000000022
    14.00        1 .  5777777
    31.00        2 .  000000000000002
    24.00        2 .  555555777777
    39.00        3 .  0000000002222222222
    34.00        3 .  55555555777777777
    54.00        4 .  000000000000000000022222
    33.00        4 .  5555555777777777
    22.00        5 .  0000000222
    18.00        5 .  55577777
    19.00        6 .  000000222
     6.00        6 .  577
     5.00        7 .  00

 Stem width:      1.00
 Each leaf:       2 case(s)
```

6. trustworthiness of CompleteTeeth extension news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    74.00        1 .  00000000000000000000000000000222222
    27.00        1 .  5555577777777
    75.00        2 .  000000000000000000000000000222222222
    33.00        2 .  5555555557777777
    49.00        3 .  00000000000000002222222
    26.00        3 .  555555577777
    34.00        4 .  00000000000002222
    17.00        4 .  55555777
     5.00        5 .  02
     4.00        5 .  57
     1.00 Extremes    (>=6.8)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

7. attitude toward CompleteTeeth after viewing negative news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

     2.00 Extremes    (=<1.0)
      .00        1 .
     6.00        1 .  57
    19.00        2 .  000022
    20.00        2 .  5557777
    47.00        3 .  000000000222222
    53.00        3 .  55555555577777777
    99.00        4 .  000000000000000000000000000002222
    16.00        4 .  55577
    31.00        5 .  0000022222
    18.00        5 .  555777
    21.00        6 .  0000022
     2.00        6 .  &
    11.00 Extremes    (>=7.0)

 Stem width:      1.00
 Each leaf:       3 case(s)
```

8. Involvement with toothbrushes Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

     1.00 Extremes    (=<1.0)
      .00        1 .
     3.00        1 .  5&
    12.00        2 .  00013
     7.00        2 .  568
    24.00        3 .  00000111133
    35.00        3 .  55555566888888888
    76.00        4 .  000000000000000000011111111333333333
    40.00        4 .  5555555555666668888
    36.00        5 .  00000000001111333
    37.00        5 .  555555555666668888
    35.00        6 .  00000000111133333
```

```
   20.00        6 .  555556666
   19.00        7 .  000000000

 Stem width:      1.00
 Each leaf:       2 case(s)
```

9. Perceived negativity of E-Machine extension news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

   37.00        1 .  000000000000000222
   16.00        1 .  55777777
   26.00        2 .  0000000022222
   26.00        2 .  5555777777777
   33.00        3 .  0000000222222222
   35.00        3 .  55555555777777777
   67.00        4 .  00000000000000000000000222222222
   40.00        4 .  5555555557777777777
   23.00        5 .  00000000222
   16.00        5 .  55555777
   11.00        6 .  00002
   12.00        6 .  77777&
    3.00        7 .  0

 Stem width:      1.00
 Each leaf:       2 case(s)
```

10. trustworthiness of E-Machine extension news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

   66.00        1 .  000000000000000000000000022222222
   31.00        1 .  555555777777777
   58.00        2 .  00000000000000000002222222222
   47.00        2 .  55555555555577777777777
   45.00        3 .  000000000000222222222
   36.00        3 .  555555555557777777
   43.00        4 .  00000000000000022222
    5.00        4 .  77&
```

```
     8.00        5 .  0002
     4.00        5 .  55
     2.00 Extremes    (>=6.3)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

11. attitude toward E-Machine after viewing negative news Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

     3.00 Extremes    (=<1.0)
     3.00        1 .  2
     6.00        1 .  557
    17.00        2 .  00022222
    20.00        2 .  555577777
    57.00        3 .  000000000000000000222222222222
    53.00        3 .  55555555555555555777777777
    73.00        4 .  0000000000000000000000000000000222222
    31.00        4 .  555555777777777
    35.00        5 .  00000000000222222
    14.00        5 .  5557777
    21.00        6 .  0000222222
     4.00        6 .  7&
     8.00 Extremes    (>=7.0)

 Stem width:      1.00
 Each leaf:       2 case(s)
```

12.Involvement with computers Stem-and-Leaf Plot

```
 Frequency    Stem &  Leaf

    12.00        1 .  00003&
    13.00        1 .  55688
    17.00        2 .  00000133
    38.00        2 .  555566666666888888
    40.00        3 .  0000001111113333333
```

```
    67.00        3 .  555555555555666666666666668888888
    47.00        4 .  000000000000111113333
    32.00        4 .  555555666688888
    28.00        5 .  0000000111333
    12.00        5 .  55566&
    17.00        6 .  0000113
    10.00        6 .  5568
    12.00        7 .  000000

 Stem width:      1.00
 Each leaf:       2 case(s)


13. age Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

     7.00       19 .  00
      .00       19 .
   158.00       20 .  00000000000000000000000000000000000000
      .00       20 .
    85.00       21 .  0000000000000000000
      .00       21 .
    40.00       22 .  0000000000
      .00       22 .
    15.00       23 .  0000
      .00       23 .
    11.00       24 .  000
    29.00 Extremes    (>=25.0)

 Stem width:      1.00
 Each leaf:       4 case(s)


14. race Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

   287.00        1 .  00000000000000000000000000000000000000000000000000
    58.00 Extremes    (>=2.0)
```

```
 Stem width:      1.00
 Each leaf:       6 case(s)


15. income Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

    22.00        1 .  0000000
      .00        1 .
    27.00        2 .  000000000
      .00        2 .
    79.00        3 .  0000000000000000000000000
      .00        3 .
    72.00        4 .  000000000000000000000000
      .00        4 .
    42.00        5 .  00000000000000
      .00        5 .
   103.00        6 .  0000000000000000000000000000000000

 Stem width:      1.00
 Each leaf:       3 case(s)


16. gender Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

   148.00       10 .  00000000000000000000000000000000000000
      .00       11 .
      .00       12 .
      .00       13 .
      .00       14 .
      .00       15 .
      .00       16 .
      .00       17 .
      .00       18 .
      .00       19 .
   197.00       20 .  00000000000000000000000000000000000000000000000000000

 Stem width:       .10
```

```
 Each leaf:       4 case(s)


17. educatio Stem-and-Leaf Plot

 Frequency    Stem &  Leaf

     3.00 Extremes    (=<1.0)
     1.00        2 .  &
      .00        2 .
      .00        2 .
      .00        2 .
      .00        2 .
   243.00        3 .  000000000000000000000000000000000000000000000000000
      .00        3 .
      .00        3 .
      .00        3 .
      .00        3 .
    93.00        4 .  000000000000000000
      .00        4 .
      .00        4 .
      .00        4 .
      .00        4 .
     5.00        5 .  0

 Stem width:      1.00
 Each leaf:       5 case(s)
```