

**Impact of Price Promotions on Customer-based Brand Equity
with a Proxy Measure**

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ABSTRACT

Impact of Price Promotions on Customer-based Brand Equity with a Proxy Measure

Hai Hong Li

In today's market place, customers tend to rely more on the established brands to simplify their brand selection and reduce their purchase risk. Creating and maintaining a strong brand brings companies many competitive advantages and long term profitability. Although price promotions have become a common marketing practice, little research has been done on their effects on brand equity and profitability in the long run.

This study examines the potential negative impact of price promotions from the perspective of customer-based brand equity by assessing how different levels of frequency and depth of sale promotions influence consumers in terms of acquiring knowledge about a brand, establishing price-related associations, and changing their response to the brand as a result. We hypothesize that overuse of temporary sale promotions might create some 'discount' associations with the brand in customers' minds and influence a company's brand equity and future benefits.

The results reveal that exposure to previous discount information induced customers to expect the retail price to be the sale price for the next period as well as to anticipate brand promotion before purchasing. Consequently, they become more reluctant to pay the regular price for the brand. Furthermore, the findings show that the expected price that customers are willing to pay for the brand has a sigmoid relation with the frequency of price promotions while it also has a concave relation with the depth of price discounts. These findings are particularly useful in guiding marketers to design optimal price promotion programs.

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SECTION 1: INTRODUCTION

Pauwels, Hanssens and Siddarth (2002) used sales data from a scanner panel to investigate effects of price promotions on sales. They found that there was no relation between price promotions and any components of brand sales, such as category incidence, brand choice, and purchase quantity due to the cancellation of immediate sale increase and the following trough during adjustment period. But obviously, the medium term effect, (i.e., the sum of short-term and adjustment period effects) is positive, implying that although price promotion cannot influence sales in the far future, it does so on a short- and medium-term basis. Indeed, both the immediate increase in sales and customer gain make price promotion an effective marketing strategy in today's highly competitive markets. In practice, price promotion has become a widely used marketing tactic to increase brand awareness by creating more trials and experience with products. In addition, it also helps increase sales, profits and gain customers from competitors.

In the meantime, brand equity has been widely recognized as the most valuable asset to companies and has become a top management priority (Keller, 2003). Purchasers are constantly facing the challenge of making sound decisions as a result of being exposed to infinite choices of brands and excessive product information. Customers tend to rely more on the established brands to simplify the purchase task and to reduce purchase risk. More companies have come to realize that creating and maintaining a strong brand will bring many competitive advantages and result in financial returns in the future.

Previous research indicates that price competition, via more extensive and aggressive use of price promotions in established firms, leads to damage in brand equity and a reduction in the profitability of brands in the long run (Aaker, 1991; Cobb-Walgren et al., 1995). Although price promotions are commonly used in practice and the positive effects on short-term sales have been repeatedly supported in the literature, little research has investigated the potential influence of price promotions on brand equity from the perspective of individual customers.

Keller (1993) defined brand equity from the perspective of individual customers as “the differential effect of brand knowledge on consumer response to the marketing of the brand” (p. 2). He also suggested that the brand knowledge was created over time by all kinds of marketing communications such as advertising and promoting programs. Thus, it is important for brand managers to understand what kind of tangible or intangible brand associations can be created in the minds of customers by a marketing program, as well as how to do so. According to Keller's (1993) customer-based brand equity model, potential sources of brand equity could be tracked and assessed to facilitate our understanding of how price promotions might hurt brand equity.

The objective of this study is to assess the negative impact of price promotions on brand equity with willingness to pay as a proxy measure of brand equity. From the perspective of individual customers, we assess how different levels of frequency and depth of sales promotions can influence the brand in consumers' minds. Moreover, it focuses on the process through which customers learn about brand knowledge, establish

price-related associations, and subsequently change their responses to the brand. A computer interactive experiment was conducted to test the ways in which different levels of frequency and depth of price promotions influence consumers in terms of their 'brand knowledge' and their resulting responses to marketing activity. We hypothesize that overuse of temporary price promotions might create some 'discount' associations with the brand in customers' minds and reduce the larger margins of a strong brand, resulting in damaged brand equity and a loss of future benefits.

In the following sections, existing theories and related findings on price promotions and the construct of brand equity will be reviewed. Based on the findings in the literature, theoretical foundations of the potential influences of price promotions on brand equity are extracted. Specific effects of frequency and depth of promotions are given; subsequently, hypotheses regarding the relations between the two factors are established. After the literature review, the design of a computer interactive experiment is illustrated, followed by the discussion of research results. Finally, findings, contributions, and limitations of the study are summarized. Future research and implications for marketers are also discussed.

SECTION 2: LITERATURE REVIEW

2.1 Effects of Price Promotions on Sales

Overall, it has been consistently found that price promotions increase sales substantially in the short run (Blattberg & Neslin, 1990). This “immediate effect” (Pauwels, Hanssens, & Siddarth, 2002, p. 425) is believed to be the main source of the positive effect of price promotions. Ailawadi and Neslin (1998) suggested that promotions encourage consumers to buy more at fewer times, stockpile more, and consume at a higher rate. According to the price-product evaluation model proposed by Dodds and Monroe (1985, 1991), the underlying rationale for this immediate sale increase is that price is both an objective product property and a subjective signal of product quality. Higher price indicates higher product quality. However, higher price also means higher monetary sacrifice to buy a product. Thus, the perceived value of a product that eventually determines purchase intention is a result of a cognitive trade-off between perceived quality and the sacrifice derived from the price. Reduced promotion price thus means less sacrifice for products with the same quality, and consequently enhances the perceived product value and increases willingness to buy.

Yet after the sale peaks, there is a trough during adjustment period. On the one hand, mere purchase effect suggests that promotions might attract new consumers and therefore increase brand awareness among potential customers (Mela, Gupta, & Lehmann, 1997). Promotions can also maintain and increase the loyalty of current customers through more

consumption experience (Erdem, 1996), and accelerate the consumption rate due to promotion-induced stockpiling (Ailawadi & Neslin, 1998). On the other hand, self-perception theory (Bem, 1967) suggests that consumers are likely to attribute their promotion purchase to external cues, such as taking advantage of a price reduction, rather than internal cues, such as brand preference. Moreover, price promotion will reduce consumers' expected price and increase price and promotion sensitivity; consequently, customers will tend to buy a product only while it is on sale (Mela, Gupta, & Lehmann, 1997). Additionally, Blatterg, Briesch, and Fox (1995) proposed that promotions might harm brand quality image. Since these contradictory effects result in a smaller negative adjustment effect compared to the short-term increase in sales (Pauwels, Hanssens, & Siddarth, 2002), price promotions increase short- and medium-term sales.

The literature on brand equity is reviewed next to explore the potential damage to brand equity implied by the adverse effects inflicted during the adjustment period.

2.2 Brand Equity

2.2.1 Construct

Consumers make their purchase decisions based on predictions of product performance. Products of a higher equity brand are usually perceived as higher quality, resulting in higher purchasing intent. Consumers use brand names as retrieval cues for information about product performance (Van Osselaer & Janiszewski, 2001). This positive association between a brand name and the perceived quality is established by a combination of consumer consumption experience and marketing (e.g., product

positioning and long-term marketing communications). Therefore, there is a difference between 'product' and 'brand.' A product is something that offers a functional benefit, whereas a brand is a name, symbol or design that can enhance the value of a particular product or service (Cobb-Walgren et al., 1995). A review of the literature on brand equity shows that most researchers accept the definition that brand equity is the value added by the brand to the product (Farquhar, 1989; Aaker, 1991; Simon & Sullivan, 1993). For example, a national brand can charge an average of 37% higher price premium than a private brand that offers the same quality products. In addition, if a national brand has higher quality than a private brand, the price premium will further rise from 28.7% to 50.4%, suggesting a great return on building brand equity (Apelbaum, Gerstner, & Naik, 2003).

2.2.2 Competitive Advantages of Strong Brands

Evidence of the power of high equity brands has been found in many marketing practices and research findings. For example, Broniarcayk and Gershoff (2003) found that the brand name of a high equity brand could offset the potential negative influence of trivial attribute strategies, and thus reduce the risk of losing customers in new product development. Indeed, it was reported that when the meaninglessness of a trivial attribute was disclosed before purchase, high equity brands benefited more from uniquely offering a trivial attribute whereas low equity brands benefited more from sharing a trivial attribute with a higher equity brand. Furthermore, even if the meaninglessness was disclosed after purchase, only the customer base of low equity brands was greatly damaged while that of high equity brands was affected to a minimal degree.

Furthermore, given high new product failure rates and high investment required for new product development, firms can take advantage of brand name awareness and brand image to enter into new markets. Regarding brand extensions, if consumers are provided with the familiarity and knowledge of an established brand, the leverage of a strong brand name can substantially reduce the risk of failure when introducing a new product into the market (Aaker & Keller, 1990).

According to consumer learning theory, the foundation of brand equity is the priority of brand name over product attributes when predicting product performance. Customers know that it is product attributes, rather than brand names, that have a direct causal relation with product quality; nevertheless, evidence of blocking from the field of learning indicates that brand name, as a signal of quality through its correlation with quality, can inhibit learning of a causal cue (i.e., product attributes) (Van Osselaer & Alba, 2000).

As mentioned earlier, Keller (1993) defined brand equity from the perspective of individual consumers as “the differential effect of brand knowledge on consumer’s response to the marketing activities of a particular brand” (p2). Brand knowledge consists of two components: brand awareness and brand image. Brand image includes various types of product-related and non-product-related brand associations that customers hold in their minds, as well as the uniqueness, favorability, and strength of these associations. Brand equity also serves as a market signal of the credibility of these brand associations (Erdem & Swait, 1998). Strong, favourable, unique associations for a brand encourage

customers to pay premium price for the brand, as opposed to paying for similar products without a brand name.

2.2.3 Measurements

In the literature, there are many ways to measure brand equity according to different definitions. From the consumer perspective, brand equity is defined as a utility, loyalty, or differential clear image that cannot be explained by product attributes. From the perspective of a firm, brand equity is stated as the incremental cash flow of products with a brand name compared to products without a brand name (Ambler & Barweitz, 1998).

Ailawadi, Lehmann, and Neslin (2003) summarized the existing measures of brand equity into three categories: 'customer mind-set,' 'product-market outcomes,' and 'financial market outcomes.' The first category, customer-based measures, includes attitudes, awareness, image, and knowledge (Agarwal & Rao, 1996). This category focuses on sources of brand equity and has good diagnostic ability. Customer-based measures are typically based on survey data and cannot provide a single, objective measure of brand equity. The other two categories, product-market outcomes and financial market outcomes, focus on outcomes of brand equity, using price premium, incremental volume, revenue, cash flow and assessing brand equity as financial assets.

Measures in product-market outcomes are more complete than those in customer mind-set, and they reflect the culmination of all the incremental benefits due to the brand name. Moreover, the outcome measures such as cash flow, which are in the form of a dollar value for financial valuation, are more reliable and objective than customer-based

measures such as attitude. However, Ailawadi, Lehmann, and Neslin (2003) argued that the popular measures in this category, such as price premium and sales premium, had some limitations and were misleading in some cases. For example, because there is an interaction between price and sales (i.e., low price will increase sales), for a brand that values low-price strategy, using a price premium measure leads to lower brand equity, which cannot reflect its strength on sales volume. Similarly, if a brand is positioned with high price and high quality, its lower sales premium hides the high price premium it possesses. Thus, the authors suggest improving these measures by using revenue premium to integrate the interaction between price and sales. Revenue premium is a more accurate and more managerially useful measure of brand equity.

Measuring brand equity with the popular measures in the marketplace mentioned above is beyond the scope of a master thesis and is not the purpose of this study. Instead, two complementary approaches, 'direct' and 'indirect' approaches, indicated by Keller (2003) are used in this study to explore the effects of price promotion on both sources and outcomes of brand equity. Given that the customer-based brand equity approach emphasizes brand knowledge and its effect on "customers' response to marketing activity" (p. 18), the indirect approach focuses on one of the sources of brand equity and tracks the changes that occur in customers' brand knowledge repertoire. Price-related associations such as customers' price perceptions and promotion perceptions are examined. For example, the most likely price that customers expect to pay for the brand as well as the promotion probabilities that they expect for the next period are measured in the study to examine changes in their perceptions. The direct approach, however, focuses

on the changes in customers' response to future price driven by their different perceptions, so we can assess the probability of the impact of a strong brand on the larger margins. As customers' willingness to pay is closely related to price premium which is the popular measure of brand equity in industries, we use it as a proxy measure of brand equity in this academic study. Specifically, considering the interactions between price and brand choice, willingness to pay is measured with purchase probabilities at different price levels to weigh the expected mean of the price that customers are willing to pay for a brand once they have been exposed to price promotions.

2.3 Effect of Price Promotions on Consumer Price and Promotion Perceptions

In this study, price promotions refer to the marketing activity in which a brand is offered with a temporary price discount that is advertised in newspapers, store flyers, or with store price labels to attract customers' attention. Following Thaler (1985), we consider the expected price to be the price that consumers are willing to pay before a purchase occasion and that they use as a reference in making purchase decisions. It is also called 'internal reference price' (Klein & Oglethorpe, 1987) as opposed to an external reference price such as the retailers' retail price.

Literature shows that, although price promotion can increase sales and brand awareness, it can also lower expected price and increase price and promotion sensitivity (Mela, Gupta, & Lehmann, 1997). In Keller's (1993) conceptual network of brand equity, price, as one of the non-product related attributes, is an important factor that influences

brand image, which is one main dimension of brand equity. Such adverse effects on brand image help explain why price promotions are found to hurt brand health. For example, when a high-equity brand offers more aggressive price promotions, customers may perceive that the brand's key differentiating features have changed from high quality to low price, which is the strength of smaller brands. The leading brand then becomes less differentiated and its brand image is injured (Orme, 1996). Furthermore, since price is also a subjective signal of product quality (Dodds & Monroe, 1985, 1991), lowered expected price raises a risk of lowered perceived product quality.

Keller (2003) suggested that because successful branding is all about creating favourable and unique brand knowledge structure in customers' minds, customers must be convinced that there are meaningful differences between the target brand and the competitors; therefore, appealing images of the products can be created. For companies, these differences result in added value to their products, which can be manifested as the price premium that customers are willing to pay for the brand among similar products. In addition to the larger margins, customers of a high-equity brand also show greater loyalty to the brand, and are more inflexible to price increases and conversely, more flexible to price decreases. It should be noted that the power of a brand lies in what customers learn, see, hear, and experience about the brand over time, and their likely response to future marketing activities will be changed accordingly. This indicates that in companies' temporary marketing activities such as price promotions, the temporary price decrease that customers have observed might change their price perception and their beliefs about the company's price policy, and create 'discount' associations for the brand in their minds.

As a consequence, they will behave differently in making a brand choice.

Kalwani and Yim (1990, 1992) used price expectation theory to explain the observed negative long-term effect of price promotions on brand choice. They found that brand purchase probabilities were significantly reduced when customers expected a price promotion but did not receive one, compared to customers who received an unexpected price promotion. Consistently, Guadagni and Little (1983) reported that repeated purchase probabilities of a brand after a promotional purchase were lower than the corresponding purchase probabilities after a nonpromotional purchase. There are several explanations for this phenomenon of lower repeated purchase rate after price promotions. One explanation is related to the comparison between expected price and retail price. Kalwani et al. (1992) argued that past prices and the frequency of price promotions together determined the expected price. A retail price higher than the reference price had a statistically significant negative impact on consumers' purchase probability (Winter, 1986). This was supported by Thaler's (1985) transaction utility theory, which assumes that consumers use transaction utility to measure the perceived savings of the offer, and they use that information to make purchase decisions. Specifically, a negative transaction utility (when the retail price exceeds the expected price) would reduce the brand purchase probability, whereas a positive transaction utility would enhance it. Similarly, the model of product evaluation proposed by Dodds, Monroe, and Grewal (1991) suggests that the comparison between the retail price and the expected price might influence customers' perception of price, monetary sacrifice and value of products. In particular, during a price promotion, customers are apt to perceive a price gain, which leads to the increased

perceived value of products and, therefore, the increased purchase probability of a brand. However, when the promotion is retracted, the same quality product is perceived as being more expensive and the monetary sacrifice is perceived to be greater, which both result in decreased perception of product evaluation and lower willingness to buy.

Alternatively, self-perception theory suggests that if a purchase was induced by an external cause (such as a price promotion) as opposed to an internal cause (e.g., preference for the brand), customers might attribute their purchase to the price promotion rather than brand preference. Consequently, when the external cause is removed during nonpromotional periods, repeated purchase probability of the brand will be lower than before the price promotion; indeed, no favourable brand associations are established or reinforced by a promotion purchase. Thus, Neslin and Shoemaker (1989) proposed another explanation: the observed lower repeated purchase rate after promotions might be due to statistical aggregation rather than actual declines in the purchase probabilities of individual consumers after a promotional purchase. Besides, the fact that more stockpiling resulting from the promotion-induced purchases will increase the probability of fewer stockouts in a certain period after the deal (Ailawadi & Neslin 1998) could be another potential reason for the lower purchase rate after the promotion event.

In sum, promotion purchases do not appear to increase brand preference. Instead, the increased price sensitivity and the promotion expectation might hurt the price premium that customers are willing to pay for a high equity brand; this is mainly due to the asymmetry effect whereby consumers react more strongly to price losses (i.e., when the

retail price is higher than the expected price) than to price gains (Gurunurthy & Little, 1989; Kalwani et al., 1990; Putler, 1990).

2.4 Asymmetry Effects of Price Gain and Loss on Brand Choice

As prospect theory (Kahneman & Tversky, 1979) states, “value function for losses is steeper than the value function for gains” (p. 279). That is, in the case of promotion expectation, losses loom larger than gains.

Kalwani and Yim (1992) found that when a brand was not promoted heavily, customers felt surprised when they encountered a price promotion. Such unexpected price promotion events affected brand purchase probability positively as discussed earlier. However, when consumers were frequently exposed to price promotions on a brand, they began to expect a discount every time they bought that brand. When a brand did not offer price promotions that a consumer had come to expect, such ‘unfulfilled promotion expectation events’ were found to cause a much larger reduction of brand choice probability. For example, their results demonstrated that only 14% of the respondents who expected a promotion on a target brand purchased it at regular price; in contrast, 40% of the respondents who did not expect a price promotion purchased it at a promoted price. The difference in the purchase probabilities was significant at $\alpha = .01$, indicating that consumers’ response to the loss of an expected promotion was stronger than their response to an unexpected promotion.

In short, although offering frequent price promotions will increase the chances of consumers observing unexpected promotions and generating a short-term sales increase, more frequent promotions with deep discounts make it more difficult for consumers to accept a regular price during nonpromotion periods. The sales gains may then be offset by the sales losses because consumers do not get the promotions they have come to expect. Consequently, the relative scale of sales gains and losses depends on the frequency and depth of price promotions, implying that the adverse effects of price promotions on price perception and promotion expectation are a function of their frequency and depth (Kalwani & Yim, 1992).

In the following sections, we will discuss specific effects of these two factors in order to establish related hypotheses.

2.5 Specific Effects of Frequency of Price Promotions

According to Helson's (1964) adaptation-level theory, price discounts only work for consumers with limited exposure to price promotions when the brand's regular price is used as a reference, and when the consumers are induced by the lower promoted price to purchase the brand. However, with an increased number of temporary sales, consumers adjust their expected price for a brand accordingly and defer purchases of the brand when it is offered at the regular price (Sawyer & Dickson, 1984). The threshold for such an effect is when consumers observe a brand to be on sale for more than half of the time; at this point, they will come to expect a price promotion and are reluctant to buy the brand

at its regular price (Lattin & Bucklin, 1989).

Another theory proposed by Tversky and Kahneman (1974) suggests that people rely on a limited number of heuristic principles to simplify their choice task when evaluating and predicting the performance of alternative products. In some cases, consumers might start with and rely heavily on a preconceived idea to make a judgment. When the frequency of past price promotions is very low, consumers identify a price promotion offer as an exceptional event and do not modify the brand's expected price. The brand's expected price then is close to the regular price because of insufficient adjustment. In other cases, consumers make an adjustment on the basis of how similar or representative the event is to a class of events. Therefore, when a brand is price promoted too often, (i.e., more than half of the time), consumers come to expect a promoted price with each purchase and expect to pay only the discounted price because of its representativeness.

2.6 Specific Effects of Depth of Price Promotions

Previous findings show that whether or not a price discount will affect the brand's expected price depends on how consumers perceive the discount.

Based on Sherif's (1963) assimilation-contrast theory, Raman and Bass (1988) postulate a region of relative price insensitivity around a brand's expected price. They suggest that changes in price within that region generate no pronounced change in consumers' perceptions. Only price changes outside that region are found to have a

significant impact on consumers' brand choice. Such threshold values representing the boundaries of the region of indifference have been consistently identified by Gurumurthy and Little (1989) and Kalwani and Yim (1992). Their empirical results illustrate that price changes of 5% or less from the brand's average nonpromotional price did not produce a significant change in consumers' price perceptions. Kalwani and Yim (1992) also found that, in agreement with price expectation theory, the threshold effects in consumers' perceptions of price gains and losses contributed significantly to the explanation of consumers' brand choice behaviour.

The specific magnitude of the price changes that significantly affect customers' perceptions have been tested by many researchers. Uhl and Brown (1971) found that 5% deviations between the regular price and the promotion price were identified correctly 64% of the time, whereas 15% price deviations were identified correctly 84% of the time. Della, Bitta, and Monroe (1980) found that consumers' perceptions of saving from a promotion purchase did not differ significantly between 30%, 40%, and 50% discount levels. However, they found significant differences between the 10% and the 30% to 50% discount levels. They also discussed some managers' beliefs that at least a 15% price discount was needed in order to entice consumers to a promotion deal. Although small price changes were not noticed by customers, a large price reduction (i.e., 60% to 70%) did not affect the brand's expected price either because it was so large that it was considered exceptional. Hence, the depth of price discounts was likely to lower the brands' expected price only when the price discount was relatively large but not too large to be seen as an exceptional event. Thus, in this study, we hypothesize that unless a price

discount is too deep (more than 50% off, for example) to be perceived to be usual by customers, within a reasonable range (i.e., more than 5% off and less than 50% off), the increase in the depth of price discount will decrease the price that customers would predict for the future, increase the probability of customers' promotion expectation, and therefore decrease their willingness to pay for the brand.

Overall, price discounts ranging from 10% to 40% are generally used by most researchers (Berkowitz & Walton, 1980; Curhan & Kopp, 1986; Kalwani & Yim, 1992). This is also the common range used by many stores for consumer packaged goods (Kalwani & Yim, 1992).

2.7 Hypotheses

Based on the literature review, we introduce hypotheses for price perception, promotion perception, and finally the expected price as a response to these variables:

2.7.1 Price Predicted For Next Period

H1a: As the observed frequency of price promotions of a brand increases, the price that customers predict for the brand in the next period will decrease.

H1b: Within a reasonable range, as the observed depth of price promotions of a brand increases, the price that customers predict for the brand in the next period will decrease.

2.7.2 Promotion Probability Predicted for Next Period

H2a: As the observed frequency of price promotions of a brand increases, the promotion probability that customers predict for the brand in the next period will increase.

H2b: Within a reasonable range, as the observed depth of price promotions of a brand increases, the promotion probability that customers predict for the brand in the next period will increase.

2.7.3 Willingness to Pay

H3a: As the observed frequency of price promotions of a brand increases, the expected price that customers are willing to pay for the brand will decrease.

H3b: Within a reasonable range, as the observed depth of price promotions of a brand increases, the expected price that customers are willing to pay for the brand will decrease.

SECTION 3: METHODOLOGY

3.1 Overview

The experiment was designed to test the ways in which the frequency and depth of price promotions influence customers' price and promotion perceptions of a high equity brand. Specifically, with the exposures of frequent price discounts in the past ten periods, we want to test how the price as well as promotion probability that customers predict for the next period will change. Subsequently, we intend to explore the resulting influence on buyers' response to the marketing element such as price (e.g., the expected price that they are willing to pay for the brand). To do so, we need to investigate two things: the discrepancy in brand equity between a target brand and a control brand, and promotion schedules and magnitude.

The discrepancy in brand equity was manipulated with two brands of highlighter pens, including a high equity brand of highlighter as the target brand and an average brand of highlighter as a control brand. Sharpie, a top brand, was selected from the highlighter market as the target brand that has the most characteristics of a high equity brand, such as a long history, an established brand name, and a reputation for its high quality. The brand is not only well illustrated and designed, but it also has advanced features. In contrast, Amoi, a fabricated brand name, acted as the control brand in this study, and has the most common features of cheap highlighter brands available in the market. Amoi can only perform the basic functions of a highlighter without any advanced features, but this brand is offered at \$1.09 per highlighter, a distinctly low price. The

features of both brands are summarized in Table 3.1. The brands were presented to the subjects in the experiment as if they were brand comparisons provided by *Consumer Surveys*, a non-profit independent organization, in order to mimic possible customer experience in the real market and create higher brand preference to the target brand, Sharpie. Like most strong brands that are positioned as high quality at a higher price, in the current study, the target brand was designed to have a price premium that a high equity brand can usually charge (i.e., regular price at \$1.99, which is 83% higher than the control brand in this study).

There were several reasons for choosing highlighters as the stimuli in the current study. Since this is a master degree thesis, it is feasible and convenient to select subjects among university students for the experiment. Moreover, highlighters are products with which most university students are familiar and have relevant usage experience. Thus, they are more likely to be interested in the experiment and have the capability of understanding and responding appropriately to the experiment manipulations, such as product/brand descriptions, price information, and questions regarding brand preference. In addition, the most important factor in selecting highlighters for this research was financial in nature, as highlighters are relatively inexpensive.

In order to manipulate the two factors of interest, that is, frequency and depth of price promotions, subjects were exposed to price and promotion information for duration of ten months before being asked to respond to questions on the dependent variables in the experiment. Four levels of frequency and 4 levels of depth of discounts constitute 16

conditions. Equal numbers of subjects were randomly assigned to each condition, with each subject only being included in one condition. For example, a subject in one condition observed a 20% off price discount 3 times in the past ten months, while a subject in another condition saw 30% off price discounts 5 times during the same period.

The experiment included three parts. In Part A, 'Purchasing Highlighters,' participants were given a scenario in which they were to imagine purchasing a highlighter in a store and making a choice between two brands: the target brand, Sharpie, and the control brand, Amoi. Subsequently, brand information and product features of the brands were provided so that higher brand preference and desired brand knowledge structures regarding the target brand were created in subjects' minds. After this section of brand equity manipulation, Part B, or 'Price Information for Ten Consecutive Months,' was presented to the subjects automatically on the computer screen in order to mimic the way in which customers observe prices in real markets. Part C included the measures for the three variables of interest mentioned above, as well as several questions to check the success of manipulations for brand equity and for the other two factors (e.g., frequency and depth of price promotions).



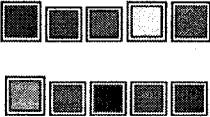



To identify the appropriate brand descriptions, brand names, features, and price levels for both brands, a pilot study was conducted. Because the two brands have distinct features, neither brand dominated the other. Pilot subjects then could switch freely from one brand to another. The results of the pilot study confirmed our assumption that with a lower price for the target brand, more customers would switch from the control brand to

the target brand, but also half of the subjects chose the target brand at its regular price.

The retail price levels in the experiment are based on the real prices in the market and are adjusted according to the feedback obtained from the subjects in the pilot study. Regarding the benefits of both brands, seven key features that are presented in Table 3.1 were chosen among many features collected from the target brand's web site. Furthermore, most pilot subjects suggested that using real product stimuli could make the benefits more tangible and authentic; therefore, product samples for both brands were provided to the participants in the experiment.

Table 3.1: Comparison of Two Brands

Consumer Surveys, a non-profit independent organization that tests products provides the following brand comparison:

Brands	Sharpie	Amoi
Features and benefits		
Product picture		
Quality rating by <i>Consumer Surveys</i>	95 out of 100	75 out of 100
Ink Volume	20 ml	26 ml
Resists smearing, Quick drying, Odorless	Yes	No
Colors available		
Versatile loop feature - easily attaches to 3 ring binders, planners and bags		No
Visible ink supply		No

Because the experiment involves a computer interactive component, a pretest was conducted before the experiment began. A warm-up session was designed to help participants become familiar with the nature of the task of purchasing a highlighter after being exposed to brand and promotion information. However, results from this pretest indicated that the nature of the task in the warm-up session was different from that in the actual study. Even though it helped the subjects to get accustomed to the task, it also distracted the subjects' attention from the main study and caused some confusion. As a result, this session was deleted from the experiment in order to make the investigation more clear and precise.

3.2 Research Design

The design is a 4 (levels of frequency of price promotion) \times 4 (levels of depth of price discounts) between-subject factorial design. In other words, for the last ten months, the target brand was promoted at one of the four possible levels of frequency (i.e., 1, 3, 5, or 7 months out of 10 months) in conjunction with one of the four possible levels of depth (i.e., 10%, 20%, 30%, or 40% off the regular price). For example, the target brand, Sharpie was offered at either regular price for \$1.99 or at one of the four levels of possible discounted price for \$1.79, \$1.59, \$1.39, and \$1.19 to one subject in his/her specific frequency condition. At the same time, the control brand, Amoi, was only promoted once at 10% off for \$0.99 in the fifth month, and was offered at regular price for \$1.09 during the other nine months in all conditions. Because the study is focused on the influence on the high equity brand, as suggested in Kalwani and Yim's (1992) study,

the 16 conditions were applied only to the target brand instead of to both brands. For the control brand, we exhibited only one condition in which one promotion at 10% off regular price was observed for the last ten months. Therefore, all participants would see the same price information for the control brand in order to validate the assumption that the differences in price and promotion perceptions and subjects' response to price of the target brand (i.e., the expected price that they are willing to pay for Sharpie) between subjects is due to the different price promotion schedules they have observed in the experiment.

130 university students were recruited from the campus to participate in the experiment. As incentive to participate in the study, a food certificate was offered in the experiment announcement (see Appendix II), and was given at the end of the study to those who participated. The announcement also indicated that the study is an academic experiment on consumers' perceptions of price at the retail level, which would last about 15 minutes and would involve answering ten questions. The participation was anonymous and no identifying information was required. The experiment was programmed in a computer interactive format and installed on about twenty computers in a computer lab (The content of the experiment on each screen is attached to Appendix I).

When subjects were invited to the computer lab, each of them received a participant code in order to be assigned randomly to one of the 16 conditions. They chose to use any of the computers available in the lab, and they entered the participant code to access one of the sixteen conditions. This design allowed subjects to participate at his/her

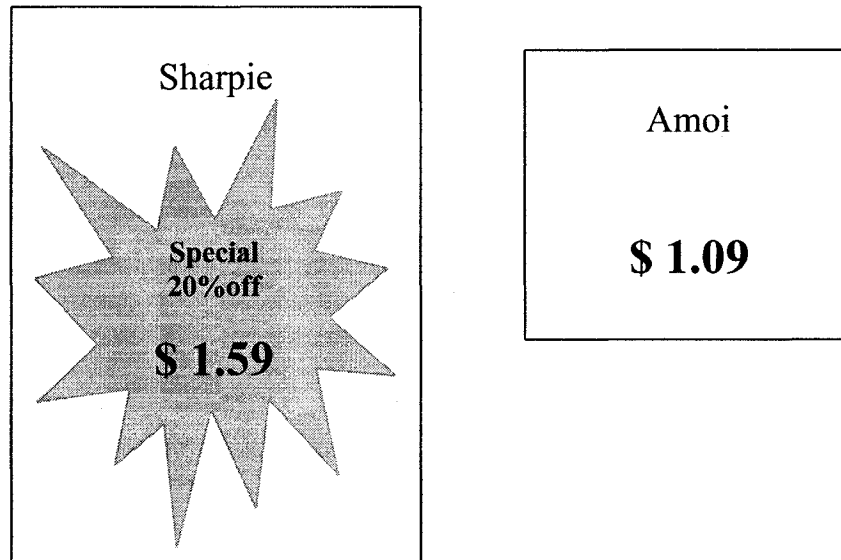
convenience during the days the experiment is being conducted, which in turn facilitated the recruitment process to a greater extent. Additionally, eight participant codes were prepared for each condition to ensure that there would be equal numbers of participants in each condition. Before starting the experiment, participants read instructions explaining the purchasing scenario, the procedures, and the three sessions of the experiment. Subsequently, the three parts of the experiment were set in motion.

In the first session in which brand equity manipulation is manipulated, participants were asked to imagine that they are in an office supply store and making a purchase decision for a highlighter by choosing from the two available brands, Sharpie and Amoi. After that, they were presented with detailed information of the brands, including the brand descriptions and product features comparisons offered by *Consumer Surveys* (see Table 3.1). At the same time, authentic stimuli, in this case a sample highlighter for each brand, were presented to each subject. They were asked to look at the highlighters while reading the brand information on the screen and then rate the brand preference for both brands without considering the price.

In the second session in which promotion frequency and depth were manipulated, the price and promotion information in the last consecutive months were automatically presented by the computer. Information for each month stayed on one screen for 12 seconds before the screen went to the next month automatically (see below an example of one screen presenting price information in the third month). Subjects were asked to pay attention to the price and promotion information on the screen without touching the

keyboard or mouse.

Month 3:



In the third and final session, participants were required to respond to a series of questions presented on the screens.

3.3 Measures

3.3.1 Two Manipulation Checks

Three questions were designed to check the success of the manipulations in this study. First, immediately after the brand/product information session, brand preference was measured to check whether the target brand has higher brand preference than the control brand. It was measured with a constant sum scale, which requires subjects to allocate 100 points between the two brands to express their relative preference for the two brands. The brands are rated based on the information about brand, product features and benefits, but

without taking the price into consideration. This was measured before any exposure to price and promotion information in the second session. Specifically, the question is formulated as such: “To express your relative preference, please allocate 100 points between Sharpie and Amoi. The more points a brand receives, the higher is your preference for that brand. If you don’t like a brand at all, simply enter zero points to it. If you like the two brands the same, each brand should receive 50 points. Note that the total of the points that you enter for the two brands should be 100.”

Subsequently in the questionnaire session, the other two questions for manipulation check were asked before posing questions on the outcome variables. To check whether participants have paid enough attention to the promotion manipulation and processed the price and promotion information, the following questions were put forth: “How many times do you think that Sharpie was on sale at a discounted price?” and “What was the average price of Sharpie when it was on promotion?”

3.3.2 Three Outcome Variables

The dependent outcome variables measured in the study included the price that customers predict for the next period, the promotion probability that customers predict for the next period, and the expected price that customers are willing to pay for the brand measured with the purchase probability at four retail price levels. They were all measured in the last session after subjects had processed both brand/product information, and price/promotion information.

Customers' price prediction for the next period was measured with three questions: "Based on the prices of Sharpie over the past 10 months, what is the MAXIMUM price that you expect for a Sharpie highlighter to be next month? What is the MOST LIKELY price that you expect for a Sharpie highlighter to be next month? What is the MINIMUM price that you expect for a Sharpie highlighter to be next month?" Kalwani and Yim (1992) measured the same variable with only one question: "Based on the prices of Brand X over the past 10 weeks, how much do you expect the price of Brand X to be this week (week 11)?" In this study, multiple questions were used in order to improve this measure. The "MOST LIKELY price" was used as the real measure of the predicted price, whereas the "MAXIMUM" and "MINIMUM" prices were used to engage subjects to think of the possible price range for next period, so they were forced to spend more time recalling the prices exposed to them in the last session. In doing so, their response would be more accurate and reasonable. The price range was also used to check whether or not subjects had processed the price information in the experiment in order to identify some outliers.

Promotion expectation is measured directly by a question: "Given the prices for the two brands for the last 10 months, how likely do you think that Sharpie will be on promotion for the next month? Please click on the number that matches your expectation." The response is on an 11-point scale, ranging from 0% to 100%, with 0% being "no chance" and 100% being "certain."

Purchase probability at four retail price levels was measured with four questions and with the same 11-point scale as the promotion probability scale; the expected price that

customers are willing to pay for the brand is calculated based on these questions. Specifically, the questions were posed as such: "Consider the prices that you have seen. If Sharpie is offered at \$ 1.99 and Amoi at \$1.09, how likely would it be for you to buy Sharpie? Please go over the following terms from left to right and then click on one of the numbers that matches your likelihood of buying Sharpie most closely." Here, the price of the target brand, Sharpie, decreases to a lower level in each of the four questions (i.e., the regular price \$1.99, 10% off price \$1.79, 20% off price \$1.59, and 30% off price \$1.39 appears respectively in the four questions), whereas the control band, Amoi, is maintained fixed at its regular price of \$1.09 across the four questions. In this way, we controlled price promotion (i.e., only once in the fifth month at 10% off regular price) and the usual retail price of the control brand, Amoi. Then we are able to assume that the sales and price of the competitive brand in the 'environment' stay constant while the target brand varies across the sixteen conditions. Finally, the expected mean of price that customers are willing to pay for the target brand was calculated. More precisely, each purchase probability was multiplied by the respective price mentioned earlier and then the average of the four products was obtained.

SECTION 4: DATA ANALYSIS AND RESULTS

4.1 Manipulation Checks

There are two manipulation checks in this study. The first one is to check if brand characteristics were manipulated successfully so as to create a higher preference for the target brand than the control brand. In other words, this check examines whether participants saw Sharpie as a better brand and therefore showed a higher brand preference for it than for Amoi. To do this, we looked at the statistics of the allocation of 100 points to the two brands, which reflects brand preference. The comparison of the mean preference of the two brands confirms the success of the brand manipulation; the mean preference for Sharpie is 72 out of 100 points with 95% confidence interval between 69 and 75, whereas Amoi has a mean of 28 points and the confidence interval is between 25 and 31. A t-test for comparing the means of the brand preference shows that the mean preference for the two brands was significantly different ($t = 22.531$, $p\text{-value} \leq .001$).

To check another manipulation for the frequency of price promotion and the magnitude of discounts, two analyses of variance (ANOVA) were conducted. The real levels of frequency and depth of discounts presented in the experiment were used as independent variables. The levels of the frequency and depth recalled by the subjects later were dependent variables. The results presented in Table 4.1 and Table 4.2 show that there was a significant relation between the independent and dependent variables (i.e., for frequency manipulation, $F(3,92)=223.951$, $p\text{-value} \leq .001$; for depth manipulation, $F(3,92)= 55.304$, $p\text{-value} \leq .001$). The actual levels of frequency explained 85.9% of the

variance in the recalled levels of frequency, whereas the real levels of depth explained 60.7% of the variance in the corresponding recalled variable. This indicates that the subjects did pay attention to our manipulation of promotions, and they processed this information during the experiment. It seems that the manipulation of the promotion frequency was stronger than that of depth of price discounts according to values of R squared (i.e., subjects recalled frequency better than the magnitude of price promotion.)

In sum, the manipulation of brand preference and the two between-subjects factors, frequency and depth of price promotions, were successful.

Table 4.1 ANOVA results with recall of how many times Sharpie was on sale as dependent variable

Source	SS	d.f.	MS	F	P-value (two-tailed)
Frequency of price promotions	487.016	3	162.339	223.951	.000
Depth of price discounts	2.185	3	.728	1.005	.394
Interaction of promotion frequency and depth of price discounts	2.899	9	.322	.444	.907
Error	66.689	92	.725		
Total	567.074	107			

R Squared = .859.

Table 4.2 ANOVA results with recall of price when Sharpie was on promotion as dependent variable

Source	SS	d.f.	MS	F	P-value (two-tailed)
Frequency of price promotions	.148	3	.049	2.056	.111
Depth of price discounts	3.983	3	1.328	55.304	.000
Interaction of promotion frequency and depth of price discounts	.157	9	.017	.727	.683
Error	2.209	92	.024		
Total	6.560	107			

R Squared = .607.

4.2 Effect of Price Promotions on Price that Customers Expect for the Next Period

For the analysis of promotions' impact on customers' expected price during the next period based on the observation of previous prices and promotions, an ANOVA of the predicted price on frequency of price promotions and depth of price discounts was conducted. The test of between-subjects effects presented in Table 4.3 show that there were significant main effects of the two factors, as well as an interaction effect between them.

As it was hypothesized, more frequent exposure to discounted prices made customers predict that the high equity brand would be at a lower price in the future. By closely examining the mean expected price at different frequency levels and their Tukey tests of mean differences as shown in Table 4.4, we found that, except for the difference in predicted price between 50% level of frequency and 70% level of frequency, all the other differences in means between adjacent frequency levels were significant at $\alpha = .05$ level.

Specifically, with 1 month of promotions out of 10 months, the predicted price decreased an average of 5% from its regular price. With 3 months of promotions, it decreased 13% from its regular price. Similarly, with promotions occurring half of the time, the predicted price declined up to 20% from its regular price. Finally, with promotions occurring 70% of the time, the expected price decreased even further to 25% from the original price at a significance level of .10 (i.e., p-value= .06).

The F- test for non-linearity shows that there was not enough evidence to claim that the trend for the frequency of price promotions is nonlinear. The Figure of marginal means of predicted price at four frequency levels (Figure 4.1) also supports an approximate linear relation.

The impact of the depth of price discounts on predicted price is quite similar to that of the frequency of price promotions. Table 4.5 reveals that the four levels of depth of price discounts (i.e., 10%, 20%, 30%, 40% off regular price) decreased the predicted price by 6%, 12%, 19%, 25% of regular price, respectively. The magnitude of the influence on predicted price by each level of depth of discounts was very close to that of the frequency of price promotions.

Again, the F- test for the linearity of the relation between depth of price discounts and predicted price was not rejected. The approximate linear relation is presented in Figure 4.2.

A significant interaction between the frequency of price promotions and the depth of price discounts was identified. To demonstrate the ways in which the promotion frequency interacts with the depth of price promotion to influence customers' predicted price, the percentage of subjects who reduced their predicted price from the regular price is summarized in Table 4.6. Most of the participants changed their predicted price from the regular price to the promoted prices presented to them in the experiment. In the $4 \times 4 = 16$ conditions (i.e., 4 levels for both frequency and depth of price promotion), it is noticed that when there were promotions 10% of the time, for different depths of discounts, the predicted prices were not influenced dramatically; that is, approximately 30% of subjects expected a discounted price for the next month. Similar results were found in conditions whereby the frequency of price promotions increased to 30% of the time but with a discount of 10%-20% off the regular price. However, within this frequency level, when the depth of price discounts were more than 30% off the regular price, there was a dramatic change in the predicted price; the majority of subjects (i.e., more than 50%) started to expect the discounted price for the next period. Indeed, with more frequent and deeper promotions, the predicted price became lower and lower. It is important to notice that in the condition of promotions in the frequency of 10% of the time at the depth of 40% off the regular price, no subject expected a lower price. This is most likely because customers think that the presence of such a deep discount at a single time should be considered to be a special or unusual event and has nothing to do with their reference price (Tversky & Kahneman, 1974). For the same reason, promotions that occurred 20% of the time at 40% off the regular price have smaller influences on predicted price than promotions that offer 30% off the regular price (i.e., 50% of the

subjects whose predicted price is lower than the regular price if 40% off discounts were observed vs. 75% of the subjects would do so if 30% off discounts were observed by the subjects.).

Table 4.3 Tests of Between-Subjects Effects with Predicted Price as Dependent Variable

Source	SS	df	MS	F	Sig.
frequency	2.491	3	.830	21.857	.000
depth	2.066	3	.689	18.130	.000
frequency * depth	1.557	9	.173	4.553	.000
Error	3.495	92	.038		
Corrected Total	9.547	107			

R Squared = .634

Table 4.4 Mean of Predicted Price at Different Frequency Levels

frequency	Mean	% decreased from regular price	Change in decrease
1	1.903	5	
3	1.739	13	8
5	1.599	20	7
7	1.497	25	5

Tukey Tests of Mean Differences

(I) frequency	(J) frequency	Mean Difference (I-J)	% of regular price	Sig.(a)
1	3	.164(*)	8%	.003
	5	.305(*)	15%	.000
	7	.406(*)	20%	.000
3	1	-.164(*)	8%	.003
	5	.140(*)	7%	.012
	7	.242(*)	12%	.000
5	1	-.305(*)	15%	.000
	3	-.140(*)	7%	.012
	7	.102	5%	.061
7	1	-.406(*)	20%	.000
	3	-.242(*)	12%	.000
	5	-.102	5%	.061

* The mean difference is significant at the .05 level.

Figure 4.1

Linear Relationship between Predicted Price and the Frequency of Price Promotions

Means of Predicted Price

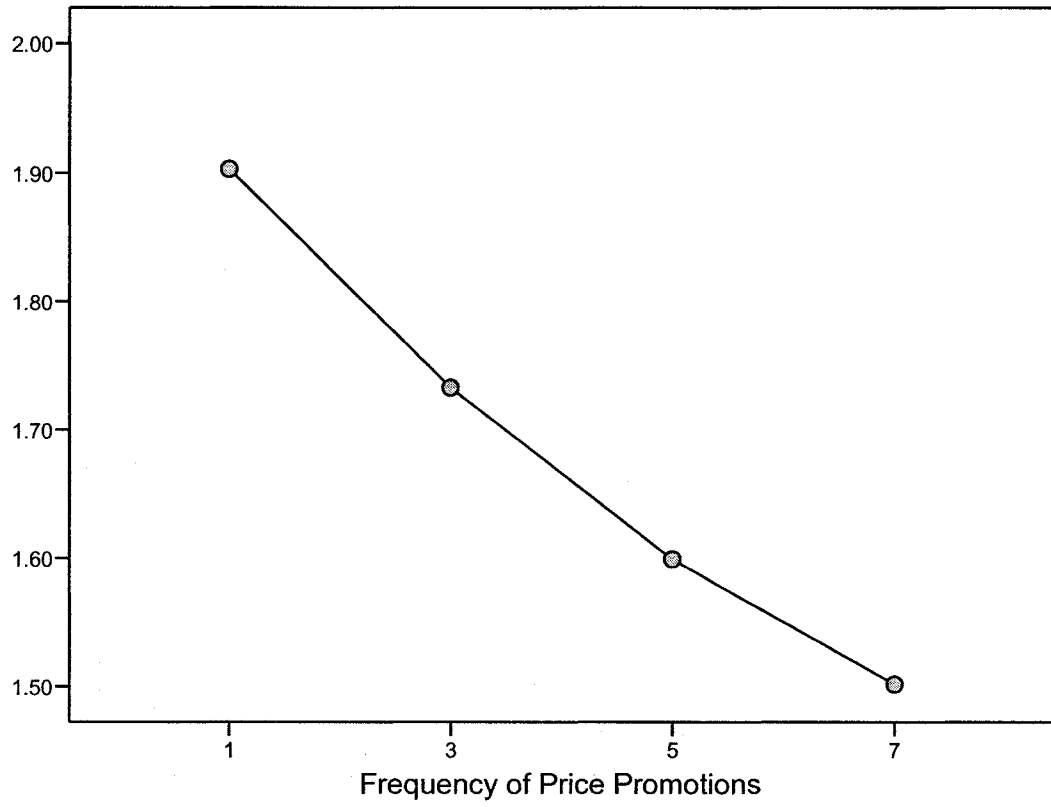


Table 4.5 Mean of Predicted Price at Different Levels of Depth of Price Discounts

Depth	Mean	% decreased from regular price	Change in decrease
0.1	1.864	6	
0.2	1.760	12	6
0.3	1.616	19	7
0.4	1.498	25	5

Tukey Tests of Mean Differences

(I) Depth	(J) Depth	Mean Difference (I-J)	% of regular price	Sig.(a)
0.1	0.2	.103(*)	6%	.049
	0.3	.248(*)	13%	.000
	0.4	.365(*)	19%	.000
0.2	0.1	-.103(*)	6%	.049
	0.3	.145(*)	7%	.009
	0.4	.262(*)	13%	.000
0.3	0.1	-.248(*)	13%	.000
	0.2	-.145(*)	7%	.009
	0.4	.117(*)	6%	.038
0.4	0.1	-.365(*)	19%	.000
	0.2	-.262(*)	13%	.000
	0.3	-.117(*)	6%	.038

* The mean difference is significant at the .05 level.

Figure 4.2

Linear Relationship between Predicted Price and Depth of Price Discounts

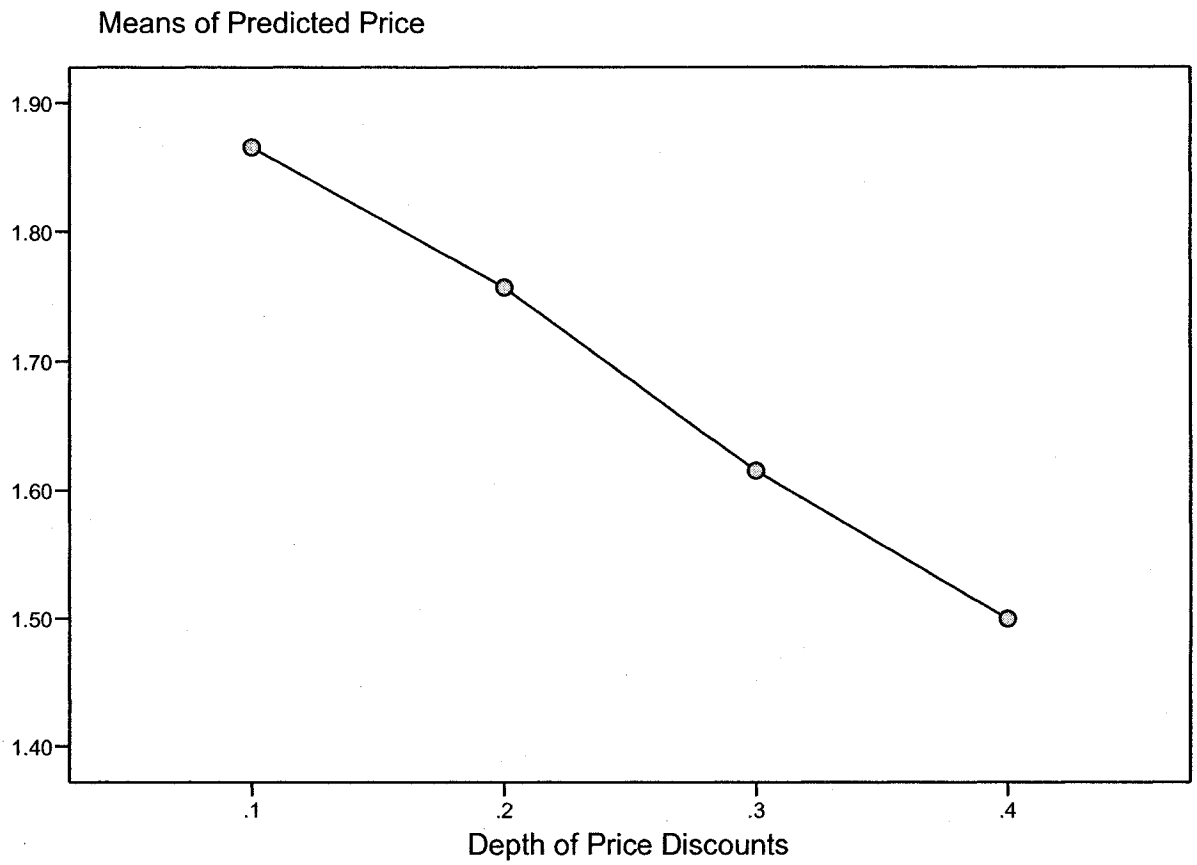


Table 4.6 Percentage of Subjects Whose Predicted Price Is Lower Than Regular Price

Frequency	Depth of price discounts			
	10% off	20% off	30% off	40% off
1	0.4	0.3	0.3	0
3	0.25	0.2	0.75	0.5
5	0.9	0.9	0.6	1
7	1	0.9	1	1

4.3 Effect of Price Promotions on Promotion Probability that Customers Expect for the Next Period

In Table 4.7, the results of ANOVA on promotion expectation with the two factors demonstrate that there was a significant main effect for promotion frequency and an interaction effect for promotion expectation.

As it was hypothesized, the promotion probability for the target brand that customers will expect for the next period increased with an increase in the observed frequency of price promotions of the brand. The mean of expected promotion probability at different frequency levels and the Tukey tests of mean differences shown in Table 4.8 indicate that each level of frequency of price promotions increased the promotion expectation by 10%, 12%, and 14%, respectively. The mean difference in promotion probability was only significant between the first frequency level, 10% of the time, and the third level, 50% of the time. This suggests again that if promotion increased to more than half of the time, customers started to expect a promotion for the next purchase (i.e., the average expected probability of a promotion is 56%, more than 50%). Further, there was no significant difference between the frequency levels of 10% of the time and of 30% of the time, whereas there was a significant increase of 14 % seen between the frequency levels of 50% of the time and of 70% of the time.

The F-test for non-linearity did not suggest a nonlinear relation between promotion expectation and frequency of price promotion, which is also supported by an approximate

line in the Figure of mean promotion probability at four frequency levels (Figure 4.3).

To assess the interaction effect, subjects in each of 16 conditions were counted as candidates to expect a promotion for next period if they predicted the promotion at a probability of more than 50%. The percentage of subjects who established promotion expectancy is presented in Table 4.9. Interestingly, there is a quite similar pattern in this table as in the table of the percentage of subjects who have lowered their predicted price (Table 4.6). Specifically, with promotions occurring 10% of the time, most customers did not expect discounts at each of the four depth levels. Similarly, few customers expected a promotion if they only observed sales 30% of the time at a depth of 10% off to 20% off the regular price. On the other hand, if promotions occurring 30% of the time had a deeper discount to 30% off, the majority of customers started to expect a promotion for the next purchase. Consistent with the findings in the literature, most customers came to expect a promotion when they observed discounts more than half of the time. Like the pattern depicted in the analysis of predicted price, no subject who had once observed a 40% off promotion expected the brand to be on sale for the next period because they attributed the sale to some special occasion. Furthermore, there was a correlation as high as .94 between the percentage of subjects who expected a promotion and that of subjects who lowered their predicted price. This indicates that customers who began to expect a promotion lowered their predicted price for the brand accordingly.

Table 4.7 Tests of Between-Subjects Effects with Promotion likelihood as Dependent Variable

Source	SS	df	MS	F	Sig.
fre	18720.175	3	6240.058	10.575	.000
dep	2209.128	3	736.376	1.248	.297
fre * dep	13144.390	9	1460.488	2.475	.014
Error	53695.504	91	590.060		
Corrected Total	84425.000	107			

R Squared = .364

Table 4.8 Mean of Promotion Probability at different frequency levels

frequency	Mean (%)	Increase
1	34	34
3	44	10
5	56	12
7	70	14

Tukey Tests of Mean Differences

(I) frequency	(J) frequency	Mean Difference (I-J)	Sig.(a)
1	3	-10	.143
	5	-22(*)	.001
	7	-36(*)	.000
3	1	10	.143
	5	-12	.081
	7	-26(*)	.000
5	1	22(*)	.001
	3	12	.081
	7	-14(*)	.044
7	1	36(*)	.000
	3	26(*)	.000
	5	14(*)	.044

* The mean difference is significant at the .05 level.

Figure 4.3

Linear relationship between Promotion Probability and Frequency of Price Promotions

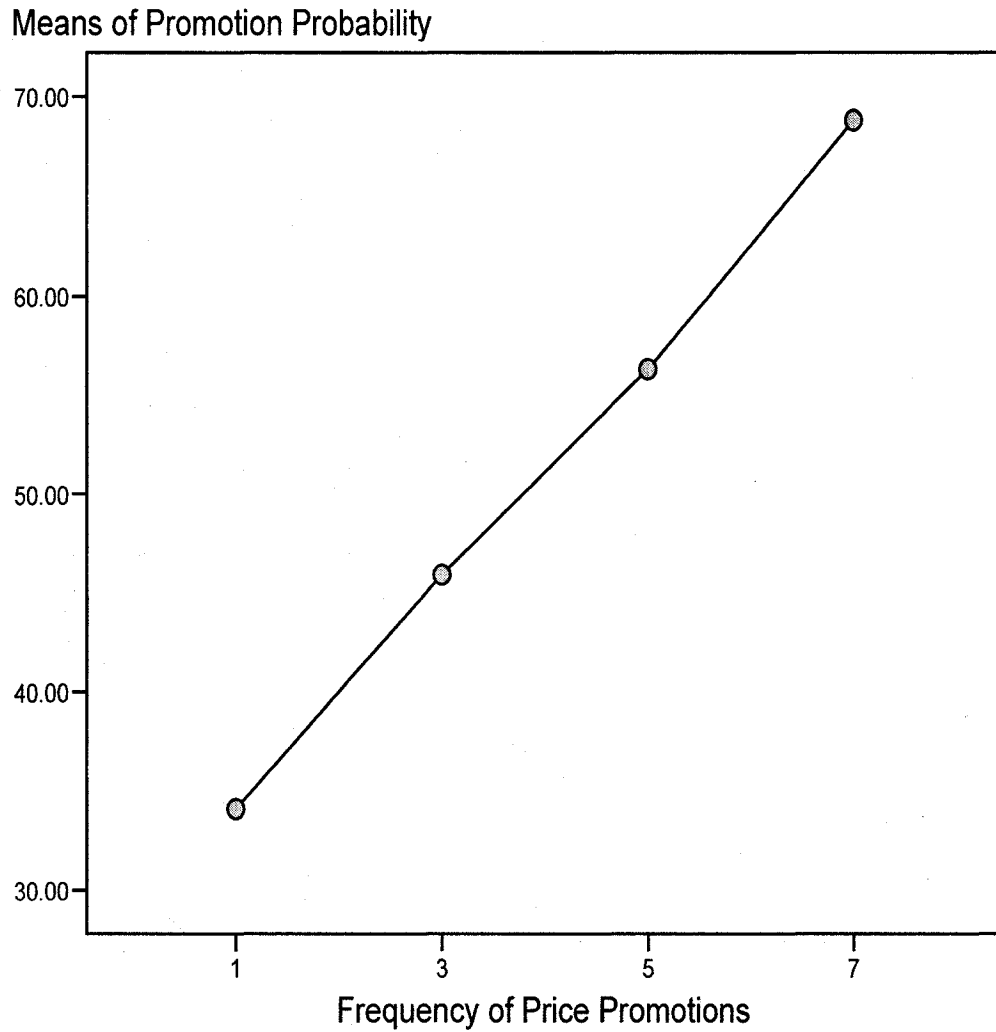


Table 4.9 Percentage of Subjects Who Expect a Price Promotion (with Promotion Probability More than 50%)

Frequency	Depth of price discounts			
	10% off	20% off	30% off	40% off
1	0.37	0.3	0.15	0
3	0.25	0.2	0.75	0.5
5	0.9	0.7	0.6	0.8
7	0.75	1	0.9	1

4.4 Effect of price promotions on the expected price that customers are willing to pay for the Brand

To examine the impact of promotions on the expected price that customers are willing to pay, an ANOVA analysis for the two factors was conducted. The results in Table 4.10 suggest that only the frequency of price promotions had a significant effect. There was neither a main effect of depth of discounts nor an interaction. Nevertheless, Figures of estimated means at different factor levels in Figure 4.4 (for factor frequency of price promotions) and Figure 4.5 (for factor depth of price discounts) indicate that expected price probably had a nonlinear relation with both factors. Specifically, expected price had a sigmoid relation with frequency of price promotions while it had a concave relation with depth of price discounts. If this is true, the results of a simple ANOVA is not reliable since it only tests linear relations with each factor. The bivariate correlations in Table 4.5 also suggest that expected price has significant correlations with frequency, cubic of frequency, and square of depth. These results are consistent with the corresponding trends implied in the two Figures.

Therefore, we conducted a regression analysis to test whether there is a non-linear relation for expected price. The findings summarized in Table 4.12 confirmed our hypotheses of a non-linear relation. The best model includes a linear and a cubic term of frequency of price promotions, indicating a sigmoid relation between expected price and promotion frequencies. It is surprising to see that there is actually a square term of the depth of price discount in the model; indeed, the main effect of the depth of discounts

was not significant in the usual ANOVA analysis because the linear trend was not significant due to the concave relation. Both nonlinear trends were significant at $\alpha = .10$ level.

Consistent with the nonlinear trends, the means and mean differences of the expected price for different levels of frequency presented in Table 4.13 show that the means of the first two levels (i.e., 10% of the time and 30% of the time) did not differ significantly from one another, and neither did the means of the last two levels (i.e., 50% of the time and 70% of the time). Yet, the mean difference between the two middle levels (i.e., 30% and 50% of the time) was ten times bigger than the differences stated above. These differences indicate that there was an essential decrease in expected price that a brand could charge when the frequency of price promotions went up to half of the time from a frequency of 30% of the time, which did not yield significant damage to the expected price.

In regard to the concave relation between the expected price and the depth of the price discount, the estimated means of the expected price at four depth levels in Table 4.14 reveal an interesting pattern; the average expected price went up a little when price discounts changed from 10% off to 20% off regular price, and then went down a little when discounts continued to increase to 30% off. Of course, these changes in the expected price were not significant. However, if discounts drastically increased to 40% off, the expected price decreased by a considerable amount. Thus, the optimal level of price discounts in this study was around 20% off. A range near this depth did not

significantly influence the expected price.

Finally, it is necessary to note that we measured the expected price based on purchase probability at four retail price levels, and we believe that the purchase probability is also determined by customers' preference for the target brand. Furthermore, as indicated in Table 4.11, brand preference had a much higher correlation with expected price than with any other factor such as frequency and depth of price promotions. Therefore, we included brand preference in the model for the expected price. The results in Table 4.10 support the conclusion that brand preference was highly significant and explained the majority of the variance in the expected price.

Table 4.10 ANOVA Results with the Expected Price as the Dependent Variable

Source	SS	df	MS	F	Sig.
Brand preference rating	18132.010	1	18132.010	11.017	.001
frequency	15857.585	3	5285.862	3.212	.027
depth	8874.995	3	2958.332	1.798	.153
frequency * depth	20975.587	9	2330.621	1.416	.193
Error	149765.300	91	1645.773		
Corrected Total	233819.406	107			

R Squared = .359

Table 4.11 Pearson Correlations between the Expected Price and Different Order of Terms

	Expected Price	Significance
Cubic of Depth	-.152	0.058
Depth	-.137	0.078
Square of Frequency	-.052	0.298
Frequency	-.281	0.002
Brand Preference Rating	.407	0.000
Square of Depth	-.209	0.015
Cubic of Frequency	-.217	0.012

Table 4.12 (a) ANOVA Results for Regression Model with the Expected Price as the Dependent Variable

Model	SS	df	MS	F	Sig.
Regression	59401.725	4	14850.431	8.770	.000(a)
Residual	174417.681	103	1693.376		
Total	233819.406	107			

Table 4.12 (b) Coefficients Results for Regression Model with the Expected Price as the Dependent Variable

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Brand Preference Rating	.969	.266	3.643	.000
Frequency	-15.122	6.473	-2.336	.021
Cubic of Frequency	1.296	.750	1.727	.087
Square of Depth	-743.480	397.848	-1.869	.064

Table 4.13 Mean of the Expected Price at Different Frequency Levels

frequency	Mean	Change
1	1.14	
3	1.18	.04
5	.90	-.28
7	.94	.04

Covariates values: Brand Preference Rating = 73.83.

Tukey Tests of Mean Differences

(I) frequency	(J) frequency	Mean Difference (I-J)	Sig.(a)
1	3	-.04	.807
	5	.25(*)	.034
	7	.20(*)	.039
3	1	.04	.807
	5	.28(*)	.021
	7	.24(*)	.028
5	1	-.25(*)	.034
	3	-.28(*)	.021
	7	-.04	.928
7	1	-.20(*)	.039
	3	-.24(*)	.028
	5	.04	.928

* The mean difference is significant at the .05 level.

Figure 4.4 Sigmoid Relation between Expected Price and Frequency of Price Promotions

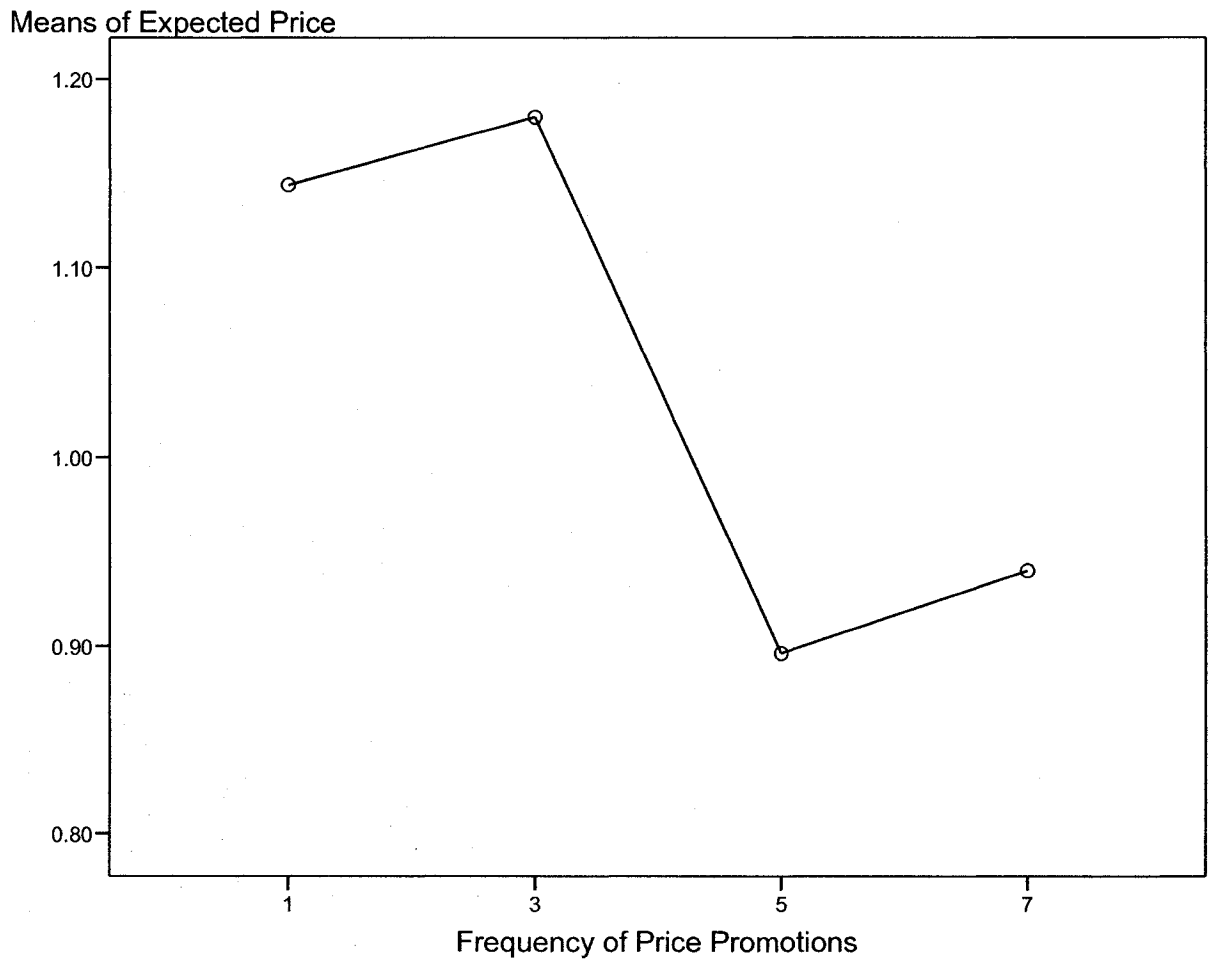


Table 4.14 Mean of the Expected Price at Different Depth Levels

Depth	Mean	Change
1	1.07	
3	1.15	.08
5	1.06	-.09
7	.88	-.18

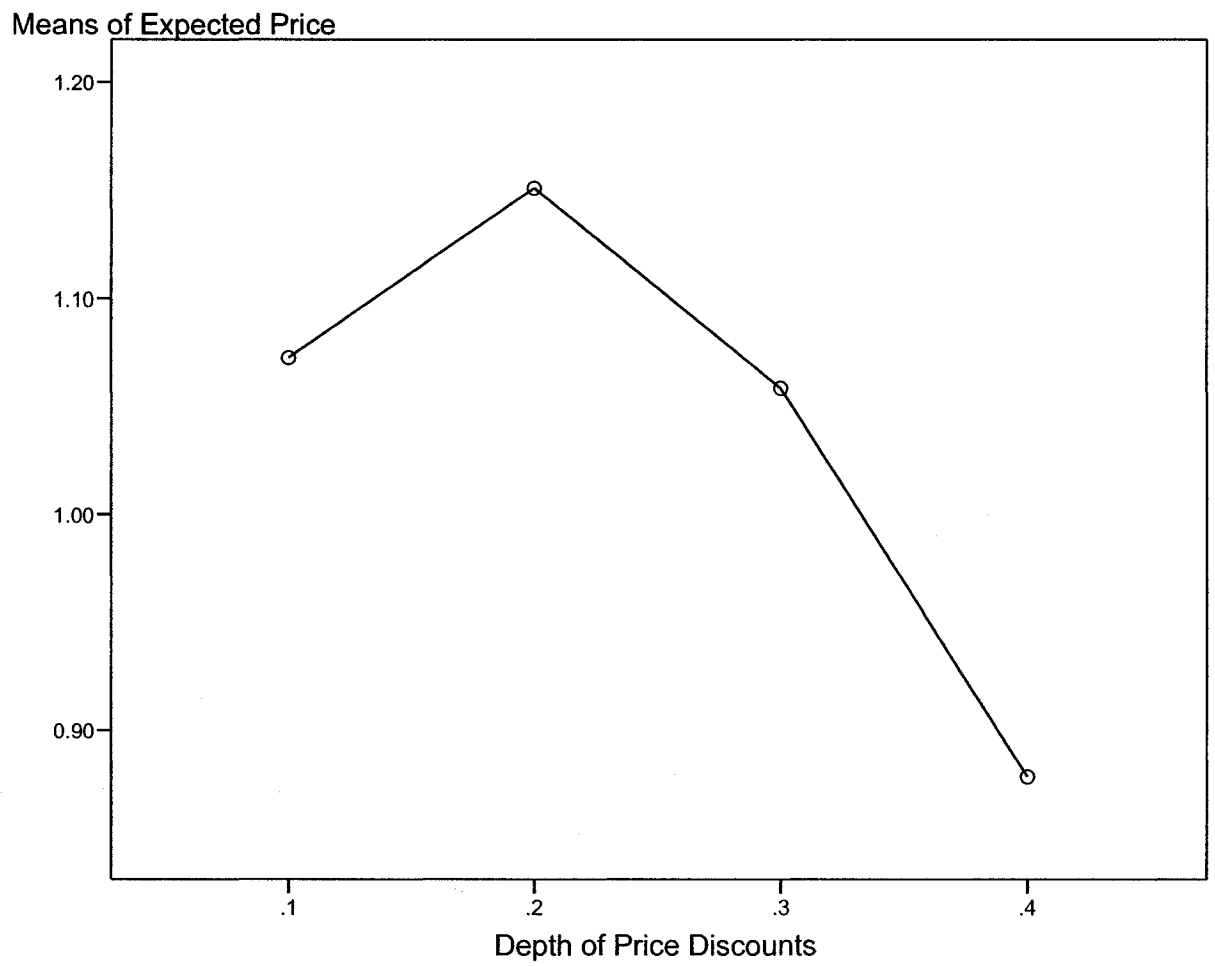
Covariates values: Brand Preference Rating = 73.83.

Tukey Tests of Mean Differences

(I) Depth	(J) Depth	Mean Difference (I-J)	Sig.(a)
0.1	0.2	-.08	.479
	0.3	.01	.990
	0.4	.19	.098
0.2	0.1	.08	.479
	0.3	.09	.503
	0.4	.27(*)	.028
0.3	0.1	-.01	.990
	0.2	-.09	.503
	0.4	.18	.110
0.4	0.1	-.19	.098
	0.2	-.27(*)	.028
	0.3	-.18	.110

* The mean difference is significant at the .05 level.

Figure 4.5 Concave Relation between Expected Price and Depth of Price Discounts



SECTION 5: DISCUSSION

5.1 Summary of the Findings

In sum, the results support the two main hypotheses: first, with an increase in the observed frequency of price promotions of a brand, the price that customers predict for the brand in the next period decreases (H1a), and second, with an increase in the observed depth of price promotions of a brand, the price that customers predict for the brand in the next period decreases (H1b).

Specifically, as the frequency of promotions increase from 10% to 30%, and to 50%, each level of frequency lowers the predicted price by 7.5% off the regular price. If the promotion occurs more than half of the time, almost all of the customers begin to expect a discounted price. These results are consistent with the findings in the literature that with 'too often' (i.e., more than half of the time) price promotions, they become predictable; when this happens, customers make a large adjustment to their reference price and eventually convert it to the discounted price (Lattin & Bucklin, 1989; Sawyer & Dickson, 1984; Tversky & Kahneman, 1974).

The influence of the depth of discounts is mainly due to the fact that customers who are exposed to price promotions will change their reference price to the discounted price. With more frequent promotions, more buyers will set the discounted price as a reference price and expect to see it for the next purchase. Similarly, with deeper discounts, lower

reference prices will be set. On average, each level of the depth of price discounts, including 10% off, 20% off, and 30% off, lowers the expected price by 6.5% from the regular price. In addition, although customers adjust their predicted price based on their observation of price promotions, if 'too deep' discounts are observed less frequently, little or no adjustment will be made because the promotions are perceived as unusual. For example, no subjects expected a lower price for the next period when they observed 40% off discounts only 10% of the time. Thus, the frequency and depth of promotions interact with each other in influencing customers' price perceptions.

Congruously, the analysis of promotion expectation also supports the two hypotheses that with an increase in the observed frequency (H2a) and the observed depth (H2b) of price promotions of a brand, the promotion probability that customers predict for the brand in the next period increases. Results indicated that the promotion expectation is mainly influenced by the observed frequency of price promotions in previous periods. Although there is not a main effect of depth of discounts, this variable influences customers' perception of promotions, especially at extreme discount levels.

Finally, the two hypotheses of expected price are also supported. This means that with an increase in the observed frequency of price promotions of a brand, the expected price that customers are willing to pay for the brand decreases (H3a), and also with an increase in the observed depth of price promotions of a brand, the expected price that customers are willing to pay for the brand decreases (H3b). Although the expected price that customers are willing to pay is mainly determined by customers' preference for the

brand, various promotion schedules and scales have significant impact on the expected price. More importantly, the negative relations between the frequency and depth of price promotions with the expected price are not simply linear. Instead, the frequency of price promotions has a sigmoid relation with the expected price. The optimal promotion schedule is around 30% of the time, and price promotion should never exceed half of the time. The concave relation between the depth of price discount with the expected price suggests an optimal magnitude of discounts within 20% off the regular price. Price discounts deeper than 30% off will most likely decrease the expected price that a brand could potentially charge.

5.2 Contributions and Limitations

This study contributes to the theory of brand management by designing an experiment and investigating the process through which price promotions change customers' knowledge and perceptions of the brand, resulting in modified responses to future prices. By observing more frequent and deeper price promotions in an established brand, customers eventually create a 'discount association' in their minds regarding the brand, leading to a decrease in brand choice and in the company's future profitability.

Some theories of consumers' perceptions might help explain the findings. For example, when consumers observe aggressive price promotions in a high equity brand, they may perceive that the brand's key differentiating features have changed from high quality to low price, which is the strength of smaller brands (Orme, 1996). As a result,

they will modify their response to the brand's marketing activities according to the new perception in the future. As in this study, when subjects were exposed to promotions at 30% off in 30% of the time, 'discount association' were linked to the brand in more than half of the subjects' minds. Before this link is established, subjects are still in the status of making minor adjustments to their brand perception without changing the brand's original image. But as long as this link is established, the brand's original image is changed and there is little chance to change this established belief and recover the image in customers' minds. Furthermore, since price is also a subjective signal of product quality (Dodds & Monroe, 1985, 1991), lowered expected price raises a risk of lowered perceived product quality and therefore reduce the repeated purchase probability at regular price.

Alternatively, to maintain the 'added value' to its products, high equity brand needs to keep their favourable and unique brand knowledge structure in customers' minds. Customers must be convinced that there are meaningful differences between the target brand and the competitors so that they are willing to pay the price premium for the brand among similar products (Keller, 2003). The establishment of 'discount association' damages the uniqueness and the strength of the high equity brand, therefore, customers are less willing to pay the price premium.

The current findings also shed light on the role of temporary marketing activities in brand building. They could be used as a guide for brand management practices. In particular, the presence of non-linear relations between the promotion frequency and

depth with the expected price implies optimal levels of frequency and depth of promotions to minimize the damage to brand equity and future profitability, while at the same time gaining sales benefits in the short run.

However, a limitation of this study is that participants' demographic information was not collected during the experiment. Without this information, the potential gender differences in customers' price perceptions and responses to the brand induced by price promotions cannot be evaluated. Furthermore, since the experiment stimulus is a highlighter, the findings are limited to the low price product category. In addition, The subjects in this study are mainly university students, who may not be representative customers in the market place. Last but important, this study mainly focuses on the influence of sales on the brand of manufacturers instead of retailers. However, in the marketplace, customers most often see promotions from the retailer's store. It is possible that they attribute retailers' sales to manufacturers' activities and thereby damage manufacturers' brands. It involves an issue of the tension that exists between the manufacturer and the retailer when a manufacturer of a high equity brand would not like a retailer to discount but the retailer believes that it is his/her interest to do so. However, if customers see promotions of a brand only in a particular store, they would think of them as retailers' activities and change the store's image over time, whereas little influence would occur to manufacturers' brand. Thus, retailers should cooperate with manufacturers to maintain the strength of a high equity brand for their shared interest in the long run.

5.3 Future Research

The limitations in the study indicate several topics for future research. First, future studies could test whether or not male and female customers perceive and respond differently to price/promotion information in various contexts. Females may care more about the discounts and respond stronger than males since they do more shopping in families and are more likely to focus on details. Second, in regard to product category, expensive products such as laptops, furniture, and cars could be potential stimuli in future research to examine whether the current findings could be generalized to other product categories. Given the popularity of sales in the furniture, electronics, and automobile industries, the implications of such research findings could be of great help to the marketers who are interested in designing and optimizing promotion schedules. As the difference in adjacent levels of discounts means greater real money value to customers, customers might be more sensitive to sales information and therefore stronger effects and lower optimal levels of frequency and depth of discounts might be observed. Finally, we suggest that, if feasible, future studies should utilize participants from the target customer groups for a specific product, especially for expensive products like those mentioned above.

Furthermore, we believe that product involvement is a potential factor that influences how customers would perceive and respond to sales. Because, overall, we would expect that the more customers are involved in a product, the more attention they would pay to its sales, in other words, more sensitive they are to price deductions, the more likely and

faster that a 'discount association' would be established in their minds, thus, the lower the optimal levels of frequency and depth of discounts to maintain the strength of a brand. This can be explored in future studies.

5.4 Implications for Marketers

Consistent with Keller (2003), the findings of this study suggest that customers' thoughts, beliefs, and perceptions linked to the brand are determined by their experiences with marketing programs over time. The future success of a brand rests with customers' knowledge of the brand and their responses to marketing activities. Keeping this in mind, marketers should take a long-term view of their marketing activities in order to maintain and strengthen their brand, because marketing activities are a link to future benefits. Given the fact that the ultimate goals of both price promotions and brand equity enhancement are to increase sales and profitability, managers should design consistent and integrated programs to strengthen their brand and establish favourable, unique brand associations in the minds of their customers. In this way, brand can function as a source of valuable benefits. It involves a trade-off between short-term and long-term benefits that a company can get from its brand. Companies who use temporary programs that yield short-term benefits but fail to support or enhance their brand equity are actually making a profit by "borrowing from its existing brand equity" (Keller 2003, p. 19).

Regarding price promotions, the results of the current study indicate that customers adjust the price of a brand that they expect to see for the next period according to both the frequency and the magnitude of sales they observed in the past. More frequent exposures

to sale promotions increasingly reduce the predicted price until customers establish a 'discount' association to the brand when they observe it more than half of the time. In this situation, customers perceive the sale as a representative event and believe it will happen in a certain pattern as part of company's marketing strategies. They come to expect a price promotion every time, and as a result, they will delay their purchase until the next sale.

The depth of the sale promotion interacts with the frequency in the process of building 'discount association.' On the one hand, deeper discounts will attract more attention from customers and facilitate the building of promotion expectation (e.g., more customers expect a promotion when sales are offered at 30% off than 20% off when this occurs 30% of the time, while there is no difference observed between the 10% off and 20% off conditions at the same frequency). On the other hand, an extremely deep discount, such as 40% off, can slow down the speed of the promotion expectation building process, since the 'too low' price is perceived as being unusual (e.g., when it happened 10% of the time, no customers expect a promotion at all).

Using the expected price that customers are willing to pay for the brand to test the changes in customers' likely response to future prices of the brand, nonlinear relations are identified in the study, suggesting that there is an optimal level of frequency and depth for price promotions. Optimal promotion programs might be around the 20% off the regular price at less than 30% of the time.

Furthermore, to sustain the price premium and to make future marketing programs

more effective, marketers need to be aware of the fact that every current marketing activity initiated by the brand could strengthen or weaken the brand associations in customers' minds. Therefore, all marketing programs should be integrated in such a way as to heighten the maximum contribution to the brand equity.

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APPENDIX I

THE COMPUTER INTERACTIVE EXPERIMENT

A Study of Consumers' Price Perceptions

Welcome! Please read the instructions in front of you. Once you are done, please wait for the research assistant to give you a code to begin the experiment.

You will enter the code provided to you in the box below.

Start

Consent Form to Participate In Research

This academic research is being conducted by a professor and a graduate student in the Department of Marketing, John Molson School of Business, Concordia University.

A. PURPOSE

The purpose of this study is to seek a better understanding of consumers' preferences of brands and perceptions of retail price.

B. PROCEDURES

The session in which you are about to participate will last about 20 minutes, during which you will be interacting with a computer.

C. CONDITIONS OF PARTICIPATION AND ANONIMITY OF YOUR RESPONSES:

- You are free to withdraw from this session at anytime if you decide to not to continue.
- You will be paid a certificate for a box of sushi for your participation.
- Your responses in this study will be kept strictly confidential. They will not be disclosed to any other parties except in terms of averages to be computed across groups of participants. Your responses will not be singled out but will be used in group averages only.
- The data collected may be used in academic publications.

CLICK ON ONE OF THE CHOICES BELOW:

- YES, I HAVE CAREFULLY READ THE ABOVE AND UNDERSTAND IT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.
- NO, I DO NOT WANT TO PARTICIPATE THIS STUDY ANY MORE.

PART A: PURCHASING HIGHLIGHTERS

Imagine that you are thinking of buying a highlighter. You happen to be at an office supply store and there are two brands available on the shelves for your choice: **Sharpie** and **Amoi**. Please note that samples of these two brands are available in front of you. Take a look at them.

In the following screens, brief **company information** about the manufacturers of these brands and a report summarizing a **comparison of the brands** are presented. The brand comparison is obtained from *Consumer Surveys*, a nonprofit independent organization that aims to provide objective and useful information to consumers.

Next

Company Information



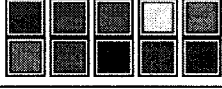



Sharpie, as a subsidiary of a fortune 500 company, is a global leader in the writing instrument and art supply industry. It brings you a wide variety of many well-known brands and offers more than 3,000 products that are recognized for their quality around the world.

Amoi is a highlighter brand exported by a Korean company that is a distributor of various office supplies including various writing instruments and novelty gift and decoration items.

Next

Comparison of Two Brands

Consumer Surveys, a nonprofit independent organization that tests products provides the following brand comparison:

Brands	Sharpie	Amoi
Features and benefits		
Product picture		
Quality rating by <i>Consumer Surveys</i>	95 out of 100	75 out of 100
Ink Volume	20 ml	26 ml
Resists smearing, Quick drying, Odorless	Yes	No
Colors available		
Versatile loop feature - easily attaches to 3 ring binders, planners and bags		No
Visible ink supply		No

Next

Companies.
Infor.

Brand
Comparison

Please note that the information that was provided to you about the highlighter brands and the companies that produce them will be available to you later in case you need them. You can access the information simply by clicking on one of the two buttons above. Go ahead and click on each button to test them.

Next

Relative Preference for the Brands:

Company
Inform.

Brand
Comparison

Now we would like you to express your relative preference for the two brands based on the information available to you. Please note that we DO NOT want you to consider price at this point. We urge you to review the “Brand Comparison” and “Company Infor.” window by clicking on the related buttons above.

To express your relative preference, please allocate 100 points between Sharpie and Amoi. The more points a brand receives, the higher is your preference for that brand. If you don’t like a brand at all, simply enter zero points to it. If you like the two brands the same, each brand should receive 50 points. Note that the total of the points that you enter for the two brands should be 100.

Brands	Points
Sharpie	_____
Amoi	_____
Sum:	100

NEXT

PART B: Price Information for Ten Consecutive Months

Next, you will be given a chance to observe the prices of the two brands of highlighters over the last ten months. The prices are for a **single** highlighter of the sample products in front of you.

In the following screens, the prices for both brands are presented for each month on a different screen. Each screen will be displayed for 12 seconds and then turn to the next screen automatically. Do not use the mouse to change the screen.

Please pay attention to the **price** of each brand and **how it changes** over time.

NEXT

Month 1:

Sharpie
\$ 1.99

Amoi
\$ 1.09


Month 2:

Sharpie
\$ 1.99

Amoi
\$ 1.09

Month 3:

Sharpie



Special
20%off

\$ 1.59

Amoi

\$ 1.09


Month 4:

Sharpie
\$ 1.99

Amoi
\$ 1.09

Month 5:


Sharpie



Special
20%off

\$ 1.59

Amoi



Special
10%off

\$ 0.99


Month 6:

Sharpie
\$ 1.99

Amoi
\$ 1.09

Month 7:

Sharpie



Special
20%off

\$ 1.60

Amoi

\$ 1.09

Month 8:

Sharpie
\$ 1.99

Amoi
\$ 1.09

Month 9:

Sharpie
\$ 1.99

Amoi
\$ 1.09

Month 10:

Sharpie
\$ 1.99

Amoi
\$ 1.09

PART C: QUESTIONS

Company
Inform.

Brand
Comparison

Now, we would like you to respond to a few questions. As you do so, feel free to refer to the brand related information by clicking on the two buttons above at any time.

NEXT

Company
Inform.

Brand
Comparison

You observed prices of the two brands for 10 months.

How many times do you think that **Sharpie** was on sale at a discounted price?
(Please enter a number) _____

What was the average sale price of **Sharpie** when it was on promotion?

(Please enter a price) \$ _____

NEXT

Company
Inform.

Brand
Comparison

Given the prices for the two brands for the last 10 months, how likely do you think that **Sharpie** will be on promotion for the next month? Please click on the number that matches your expectation.

<u>No Chance</u>	<u>Very slight possibility</u>	<u>Slight possibility</u>	<u>Some possibility</u>	<u>Fair possibility</u>	<u>Fairly good possibility</u>	<u>Good possibility</u>	<u>Probable</u>	<u>Very probable</u>	<u>Almost sure</u>	<u>Certain</u>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

NEXT

Based on the prices of **Sharpie** over the past 10 months,

What is the **MAXIMUM** price that you expect for a **Sharpie** highlighter to be next month? \$ _____

What is the **MOST LIKELY** price that you expect for a **Sharpie** highlighter to be next month? \$ _____

What is the **MINIMUM** price that you expect for a **Sharpie** highlighter to be next month? \$ _____

NEXT

Company
Inform.

Brand
Comparison

Consider the prices that you have seen. If **Sharpie** is offered at \$ **1.99** and Amoi at **\$1.09**, how likely would it be for you to buy **Sharpie**? Please go over the following terms from left to right and then click on one of the numbers that matches your likelihood of buying Sharpie most closely. Note that the likelihood ranges from 0% to 100%, with 0% being “no chance” and 100% being “certain”.

<u>No Chance</u>	<u>Very slight possibility</u>	<u>Slight possibility</u>	<u>Some possibility</u>	<u>Fair possibility</u>	<u>Fairly good possibility</u>	<u>Good possibility</u>	<u>Probable</u>	<u>Very probable</u>	<u>Almost sure</u>	<u>Certain</u>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

NEXT

Company
Inform.

Brand
Comparison

If **Sharpie** is offered at \$ 1.79 and Amoi at \$ 1.09, how likely would it be for you to purchase **Sharpie**?

<u>No Chance</u>	<u>Very slight possibility</u>	<u>Slight possibility</u>	<u>Some possibility</u>	<u>Fair possibility</u>	<u>Fairly good possibility</u>	<u>Good possibility</u>	<u>Probable</u>	<u>Very probable</u>	<u>Almost sure</u>	<u>Certain</u>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

NEXT

Company
Inform.

Brand
Comparison

If **Sharpie** is offered at \$ 1.59 and Amoi at \$ 1.09, how likely would it be for you to purchase **Sharpie**?

<u>No Chance</u>	<u>Very slight possibility</u>	<u>Slight possibility</u>	<u>Some possibility</u>	<u>Fair possibility</u>	<u>Fairly good possibility</u>	<u>Good possibility</u>	<u>Probable</u>	<u>Very probable</u>	<u>Almost sure</u>	<u>Certain</u>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

NEXT

Company
Inform.

Brand
Comparison

If **Sharpie** is offered at \$ 1.39 and Amoi at \$ 1.09, how likely would it be for you to purchase **Sharpie**?

<u>No Chance</u>	<u>Very slight possibility</u>	<u>Slight possibility</u>	<u>Some possibility</u>	<u>Fair possibility</u>	<u>Fairly good possibility</u>	<u>Good possibility</u>	<u>Probable</u>	<u>Very probable</u>	<u>Almost sure</u>	<u>Certain</u>
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Next

Do you think the instructions and questions are easily understood?

Yes

No

If you have any comments or suggestions for improving the experiment, please write it below. Thank you!

FINISH

This session is over.
Thank you for your participation!

When you leave, please sign a list to receive the
remuneration for your participation.

APPENDIX II
EXPERIMENT ANNOUNCEMENT

Less than 15 min. , get a free box of Sushi!



Participate in an academic experiment* on consumers' perceptions of price at the retail level. You will spend **less than 15 minutes** answering about **10 questions** on a computer and will receive a **sushi certificate** from Sushi Shop on Mackay Street. Your participation is anonymous and we guarantee your privacy. Please note that each student may only participate once.

When: This Wednesday (16th) and Thursday (17th)
From **12:30 pm to 6:30pm** every afternoon

Where: 1550 de Maisonneuve, Computer lab GM-210 (M.I.S. Advanced Lab, SGW Campus)

* This study has been approved by Concordia University's Human Research Ethics Committee.