

Innovation in Context: The Effect of Diminishing Sensitivity, Reference
Dependence, and Goal Orientation on Consumer Acceptance of New Features

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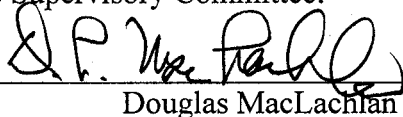
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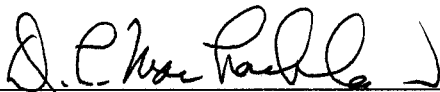
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Abstract

Innovation in Context: The Effect of Diminishing Sensitivity, Reference
Dependence, and Goal Orientation on Consumer Acceptance of New Features

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The same level of product feature enhancement can have differential effects on consumer choice depending on the product's other feature levels, and consumers' expectations for its features. Based on decreasing marginal utility and theories that derive from it, in Chapter 1 I present that a given level of feature enhancement has the greatest effect on brand choice for those brands whose other features are at relatively lower levels. Actual transaction data from an internet auction site is used to demonstrate that feature enhancements result in a greater increase in choice for those products whose other features are relatively inferior.

A boundary condition for this theory is explored in Chapter 2. Consumers have general expectations for a product's features, and if the lower-end model falls below those expectation levels, enhancing a feature will not result in a greater impact on choice. By designing and conducting a lab experiment that measured people's expectation levels for a product's features as well as their brand choices, it is demonstrated that feature enhancements do not increase choice when a product's other features fall below consumers' expectations.

Chapter 3 demonstrates that self-regulatory focus influences consumer preference for brands and innovative features. It also extends the work of Nowlis and Simonson (1996) by illustrating that when a product's target consumers are relatively promotion-oriented, new or comparatively weak brands will profit more than relatively strong brands from the introduction of new features. Where respondents are prevention-oriented, however, new or comparatively weak

brands do not profit more than relatively strong brands. Also, where quality-assurance mechanisms, such as brand trust, are in place, price expectations reported by prevention oriented respondents were not significantly different from those of other respondents. Brand affect will positively influence brand choice for promotion-oriented individuals, but prevention-oriented individuals will prefer lower prices to higher equity brands.

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PREFACE

Chapter 1: Multi-Attribute Diminishing Sensitivity is partly based on work presented at the 2006 INFORMS Marketing Science Conference in Pittsburgh, PA, and makes up a substantial portion of a paper with Prof. Erica Okada that is (as of this writing) under review at the Journal of Marketing.

Chapter 2: The Feature Acceptability Threshold is also substantially treated in the working paper with Prof. Okada, and was presented at the 2007 Fordham University Pricing Conference. Although I believe that the revisions made by Prof. Okada and myself improve the paper, they are largely omitted from this dissertation version. The general findings and conclusions remain the same.

In my dissertation proposal, I included a chapter on pioneering. I have opted to remove that section and replace it with Chapter 3: The Role of Regulatory Focus in Product Innovation and Brand Value. This chapter will be submitted for publication as a separate paper in 2008.

ACKNOWLEDGEMENTS

The author wishes to thank the Department of Marketing and International Business for its long-term support of this endeavor and everything that lead up to it. He further wishes to acknowledge the members of his committee for their contribution to his development as a researcher. While every member of the committee has contributed in some way to this work, special thanks go out to Erica Okada, Doug MacLachlan, and Bob Jacobson, without whom this would not have been possible. He also gratefully acknowledges the support, contribution, and encouragement of the Microsoft Corporation, Chris Chapman, Mark Staton, and above all his brilliant wife Brooke.

DEDICATION

To Brooke (of course), and in loving memory of Mabel R. Hammond.

INTRODUCTION

In the following three sections, I demonstrate that the attractiveness of a given product feature or characteristic is highly dependent on factors other than the feature itself. These factors include other product features, consumer performance expectations, or differences in the goals of consumers evaluating the product.

In Chapters 1 & 2, I investigate how a given level of feature or brand quality will effect the value placed on another feature (or a change in another feature) within the same product. More specifically, I show in Chapter 1 that an improvement in a given feature will be more valuable in a product where other features are relatively low in quality than in products where other features are relatively high in quality. I relate this effect to multi-attribute diminishing sensitivity, a concept developed by Nowlis and Simonson in 1996. In Chapter 2, I show that an improvement in a given feature will be less valuable in a product where another feature is so low in quality as to be considered beneath performance expectations than when the improvement is added to a product in which all features meet expectations. I refer to this as the reference dependence effect. In Chapter 3, I show that the interaction between brand quality and feature innovation is highly dependent on the goal orientation of the consumer that is evaluating the product.

The principle that patterns of preference will vary based on context is by no means new (c.f., Tversky and Kahneman 1981). This research extends that principle and provides implications that are perhaps surprising. Suppose, for

example, that some individual (call her Mary) were to purchase a cheap digital watch and an expensive cell phone. Either of these devices may include an alarm clock, which Mary needs. Multi-attribute diminishing sensitivity suggests that the alarm clock feature would be more valued in the digital watch than in the cell phone – even though the feature itself would be identically useful in either device. Now suppose that the only digital watch available did not include a stopwatch feature, something that Mary believes should be standard in any digital watch. According to reference dependence, which I introduce in Chapter 2, Mary's evaluation of this unsatisfactory watch would not be much improved by the alarm clock; in this case the alarm clock may add more value to the cell phone.

Mary's expectations will change over time. A cell phone that she found acceptable last year may no longer offer the storage capacity she has come to expect based on newer models. This is one way in which firms may influence consumer reference levels – by manufacturing and promoting products with feature levels that exceed prior standards.

More difficult to influence is the mental state in which Mary considers a purchase. As discussed in Chapter 3, one aspect of her mental state – self-regulatory focus – will strongly affect how she evaluates an innovative feature, or even an established brand. Self-regulatory focus is both an individual difference and contextually malleable, so the firm may have limited success in influencing whether Mary is prevention-oriented or promotion-oriented at the time of purchase.

A better strategy may be to alter the product and message to suit the prevailing regulatory focus in the target market.

In any case, marketers will do well to remember the importance of context when making decisions about product updates. Research that tests a feature in isolation and without considering the goals and regulatory foci of likely consumers will provide a poor indication of how that innovation will perform in the marketplace.

CHAPTER 1: MULTI-ATTRIBUTE DIMINISHING SENSITIVITY

Firms improve features in products in order to expand their market and remain competitive. As firms make decisions about whether to add features to products or to augment existing features, it is of great importance to understand how the new or augmented features will interact with existing features. By definition, augmenting a product feature set with a complementary feature (Chernev 2005) will add value to that product. What is not clear, however, is whether this additional value is constant, or whether it depends on the quality of the preexisting features.

Traditional economic theory would suggest that when two goods are complements, more of one increases the value of the other. For example, if you like apples with peanut butter, having more apples will make additional peanut butter more valuable to you. There is good reason to believe that this is not the case with complementary features, however. Economic theory also describes the effect of decreasing marginal utility, and recent research into multi-attribute utility theory would imply that decreasing marginal utility should apply not only when the number of items possessed by an individual increases but also when the overall utility from a given product increases.

In this chapter and in the following chapter, I investigate the question of feature quality interaction. Here, I present empirical results that support and

extend the concept of Multi-Attribute Diminishing Sensitivity (Nowlis and Simonson 1996).

Theoretical development

In economics, diminishing marginal utility presents that having more goods is always better, but decreasingly so with each additional unit (Bernoulli 1738/1954; Meyer and Johnson 1995). One apple is better than no apples, and ten apples are better than nine. The tenth apple is still valuable, but less so than the first.

Diminishing utility applies to specific features of products as well. For example, an 800 ft² condominium unit is more desirable than a 500 ft² condo, and a 2,800 ft² condo is more desirable than a 2,500 ft² condo. An additional 300 ft² of space is always valuable, but going from 500 ft² to 800 ft² in floor space makes a bigger difference in terms of the overall desirability, than going from 2,500 ft² to 2,800 ft².

Nowlis and Simonson (1996) generalize the concept of diminishing utility across different product attributes in their theory of multi-attribute diminishing sensitivity. In a variety of product categories: sunscreen lotion, binoculars, microwave ovens, and color televisions; a given new feature resulted in greater increases in what people were willing to pay when added to products with lower levels of other attributes, than to those with higher levels of other attributes.

Essentially, adding a positive feature helps those products that are relatively inferior to a greater extent than it helps those that are relatively superior.

Multi-attribute diminishing sensitivity (Nowlis and Simonson 1996) is consistent with multi-attribute utility theory, which explains consumers' preferences and choices as a function of products' attribute levels and importance (Bettman et al. 1975; Bettman and Zins 1977; Green et al. 1981; Kahn and Meyer 1991; Shocker and Srinivasan 1979). A relatively superior/inferior product is characterized by a combination of higher/lower levels of attributes, which sum up to a higher/lower level of total utility. Assuming a concave utility function, a new product feature with a given level of utility would make a greater positive change in the total utility of a relatively inferior product than a relatively superior one.

The central argument of this chapter is that same level of enhancement of one feature has different effects, depending on the other features of the products. This extends on Nowlis and Simonson's (1996) model of diminishing sensitivity across attributes in two principal ways. First, it further generalizes the theory. The previous study examined the differential effect of adding a new feature. I propose that diminishing sensitivity across attributes applies more generally to enhancements of already existing features as well. That is, when any attribute is enhanced by a given magnitude, the increase in the overall utility would be greatest for those products with lower levels of the other attributes.

It has been suggested that consumers have a preference for products with balanced attributes (Chernev 2004). For example, if two products attributes are rated on a scale of 1-100, a product scoring (60, 60) on the two attributes are preferred over one scoring (50, 70), or (70, 50), because there is more balance between the two attribute ratings.

My model of multi-attribute diminishing sensitivity can make predictions that differ from the balanced attribute theory, depending on the initial feature levels of the alternatives. Suppose there are two products, defined in terms of the same two attributes as shown in Figure 1. A given level of enhancement can be added to attribute 2, as shown in Figure 2. To which of the two alternatives should the enhancement in attribute 2 be allocated? The balanced attribute theory would choose alternative 1, because it will become more balanced with the enhancement of attribute 2. In contrast, multi-attribute diminishing sensitivity predicts that alternative 2 would gain more from the same level of enhancement of attribute 2.

I explore the differential effect of feature enhancements using actual transaction data from an Internet auction site to examine the extent to which enhancements in one feature are more effective in increasing consumer choice, when the other feature levels are lower. In Chapter 2, I discuss a boundary condition for this effect, and demonstrate this boundary condition by measuring people's expectations for attribute levels in addition to their responses to different combinations of attribute levels.

Study One

I collected data from 3,239 completed auctions of tickets to Major League Baseball games between the Boston Red Sox and visiting teams in Fenway Park in 2005. Baseball tickets were used in this analysis because the attribute variables are limited and straightforward. Tickets are generally characterized on two dimensions: *seat quality* and *event attractiveness*. Also, baseball stadiums are large and offer a wide variance in seating classes with many seats available within each class. Furthermore, baseball has a long season (162 games), offering games against a variety of opponents each offering different levels of event attractiveness. The Boston Red Sox' home field, Fenway Park, was chosen due to the consistent, high demand for tickets at the venue. The Red Sox won baseball's World Series in 2004, and tickets sold out within a few days of becoming available in 2005. This benefits the analysis in two ways. First, the secondary market is generally the only channel available to purchasers since tickets were usually not available from the box office during the 2005 season. Second, availability of tickets through the box office would set a ceiling on willingness to pay in the secondary market, i.e. purchasers would have no incentive to pay more than the box office price and selling prices at auction would not be as informative.

Data

The data were extracted from nearly every auction for tickets to home Red Sox games in 2005 that ended on eBay prior to July 19, 2005. This was achieved using a set of customized data mining programs developed in the Perl and PHP programming languages. In order to control for any kind of pennant race effect, all auctions used in this analysis closed prior to the All-Star break in early July. Tickets to games against Red Sox' archrival New York Yankees were also excluded. For each transaction, the transaction price, the face value of the ticket, the opposing team, and several control variables (described below) were recorded.

Attribute one: seat quality

The face value of the tickets was used as a measure of seat quality. The box office sets the face values of tickets to reflect the varying desirability by seating section. For example, box seats are generally considered to be better than bleacher seats, and box office pricing reflects this difference.

Attribute two: event attractiveness

Since the Red Sox remained in second place in the American League East Division for nearly the entire first half of the 2005 season, there was little change in home team expected performance, so event attractiveness varied mainly by the expectations about the visiting team. The expected performance of the visiting team is in turn a function of the weighted average record of that team.

The weighted average record for each team is calculated as the percentage of games won during the 2004 season plus the percentage of games won as of the Saturday preceding the auction close multiplied by (1 - season week number for the auction close), all divided by the season week number.

For example, suppose an auction for tickets to see the Cleveland Indians play the Red Sox ends on May 10th, which was in the fifth week of the 2005 season. The Indians winning percentage for the 2004 season was .494 (mlb.com 2005). As of Saturday, May 7th, Cleveland won 12 games and lost 16, which amounts to a winning percentage of .429 (NYT 2005). The weighted average record for this auction is therefore calculated as:

$$\frac{.494 + (4 \times .429)}{5} = .442$$

The reason for this complicated formula is that early in the season, expected performance of a given team will be based largely on their prior season performance. As the season progresses, expected performance becomes more and more dependent on current season performance. Since the winning percentage at the end of any given week also includes the preceding weeks, it is multiplied by the number of weeks that have already passed in the season. The first week of the season is disregarded in this calculation since all opponents will be assessed solely on prior season performance during that week.

Measuring diminishing sensitivity across attributes

Starting with the basic model (1.1) where V is a buyer's willingness to pay and A_1 and A_2 are each positive independent attributes of product choices in the consideration set, in this study seat quality and event attractiveness respectively.

$$(1.1) \quad V = \alpha_0 + \alpha_1 \cdot A_1 + \alpha_2 \cdot A_2 + \varepsilon$$

If one assumes that greater amounts of each attributes are strictly preferable to lesser amounts, both α_1 and α_2 will be positive. Diminishing sensitivity across attributes suggests that, even where the attributes themselves are independent of one another, the value the consumer places on the quality of one attribute is dependent on the quality of the other attribute. In other words, α_1 is a function of A_2 . In order to account for possible non-linearity in the relationship between a given attribute and willingness to pay, α_1 is also modeled as a function of A_1 .

Specifically:

$$(1.2) \quad \alpha_1 = \alpha_{11} + \alpha_{12} \cdot A_1 + \alpha_{13} \cdot A_2$$

One may account for non-linearity in A_2 in a similar manner, i.e.:

$$(1.3) \quad \alpha_2 = \alpha_{21} + \alpha_{22} \cdot A_2$$

Since $A_1 \cdot A_2$ is equivalent to $A_2 \cdot A_1$ (already included in equation 1.2), the interaction effect need not be included in equation (1.3). Reinsertion of these variables into the original model results in:

$$(1.4) \quad V = \alpha_0 + (\alpha_{11} + \alpha_{12} \cdot A_1 + \alpha_{13} \cdot A_2) \cdot A_1 + (\alpha_{21} + \alpha_{22} \cdot A_2) \cdot A_2 + \varepsilon$$

Or:

$$(1.5) \quad V = \alpha_0 + \alpha_{11} \cdot A_1 + \alpha_{12} \cdot A_1^2 + \alpha_{13} \cdot A_1 \cdot A_2 + \alpha_{21} \cdot A_2 + \alpha_{22} \cdot A_2^2 + \varepsilon.$$

In this study, the two attributes are seat quality measured as face value (FV) and event attractiveness measured by the opposing team's record (REC), so the estimating model becomes.

$$(1.6) \quad V = \alpha_0 + \alpha_{11} \cdot FV + \alpha_{12} \cdot FV^2 + \alpha_{13} \cdot FV \cdot REC + \alpha_{21} \cdot REC + \alpha_{22} \cdot REC^2 + \varepsilon$$

The purpose of this study is to test for diminishing marginal sensitivity across attributes. It is therefore predicted that the interaction effect between the variables (α_{13}) will be negative.

Results:

The estimation results of equation (1.6) are provide the results in the middle column of Table 1. Higher seat quality as measured by face value, commanded a higher price ($t = 6.6, p < .01$), as did higher levels of event attractiveness as measured by the opposing team's record ($t = 3.0, p < .01$). That made intuitive sense. This model also tested for decreasing marginal sensitivity in attributes. For event attractiveness, the estimate was directionally supportive, but to no level of significance. The ticket became increasingly more valuable with higher levels of event attractiveness, but not necessarily at a decreasing rate ($t = -.36$). For seat quality, the model actually suggested increasing rather than

decreasing marginal sensitivity ($t=10.75, p < .01$). However, this may not necessarily indicate increasing marginal utility as it may just reflect imperfections in the pricing of face value. This model uses face value, as set by the box office, as a measure of seat quality. Reasonably, better seats have higher face values assigned. However, the extent to which the dollar value differences in face values capture the difference in enjoyment levels of the respective seats may be less accurate.

The purpose of this model was to look for evidence of marginal sensitivity across product attributes: that is, a negative interaction between seat quality and event attractiveness. People paid more for higher levels of seat quality ($t = 6.6, p < .01$), but to a lesser extent at higher levels of event attractiveness ($t = -25.8, p < .01$). Similarly, they paid more for higher event attractiveness ($t = 3.0, p < .01$), but to a lesser extent at higher levels of seat quality ($t = -25.8, p < .01$). Generally, buyers are less (more) sensitive to increases in one of the attributes when the value of the other attribute is high (low). The data supported diminishing sensitivity across attributes.

Controlling for auction characteristics that determine selling price

Online auctions are a useful domain in which to test for diminishing sensitivity between features. eBay hosted approximately 1.4 billion transactions in 2004 (eBay 2004 Annual Report). At any given moment, eBay is hosting tens of thousands of auctions for event tickets. Because it is the buyer who determines the final selling price in most cases, these auctions provide useful

information regarding the value that consumers place on a given set of tickets. However, extant literature suggests that transaction prices may also be affected by factors that are unique to online auctions. I control for some of those factors in the following analysis.

Ariely and Simonson (2003) find that lead time is positively associated with selling price, i.e., the more time between the auction and the event, the higher the selling price. Lead time (L) is measured as the number of days between the end of the auction and the event, i.e. auctions that end well before the event will have a higher lead time than those that end just a few days before an event. The higher lead time allows bidders more time to plan the event in their schedules.

Ariely and Simonson (2003) also find that auctions with relatively high (low) minimum bids result in a relatively higher (lower) selling prices. Other research, however, has shown precisely the opposite effect; auctions with relatively low starting prices increases the number of bidders and thereby results in a higher selling price than observed in auctions with high starting prices (Kamins et al. 2004). Since both findings suggest that auction starting price influences selling price, starting price per ticket (SP) was included in the model.

Featured Auctions are auctions for which the seller has paid a placement fee to have the auction placed near the top of search result pages. These auctions are designated with the indicator variable FA .

Inserting these auction control variables to equation (1.6) results in:

$$(1.7) \quad V = \alpha_0 + \alpha_{11} \cdot FV + \alpha_{12} \cdot FV^2 + \alpha_{13} \cdot FV \cdot REC + \alpha_{21} \cdot REC + \alpha_{22} \cdot REC^2 \\ + \alpha_3 \cdot OD + \alpha_4 \cdot D + \alpha_5 \cdot L + \alpha_6 \cdot SP + \alpha_7 \cdot FA + \varepsilon$$

Results:

The results of equations (1.6) and (1.7), provided in Table 1, demonstrate a clear negative interaction effect between the seat quality and event attractiveness attribute variables. This means that buyers are less (more) sensitive to increases in one of the attributes when the value of the other attribute is high (low). Multi-attribute diminishing sensitivity is supported.

The Row Effect

The face value of a ticket is set by the box office on a section by section basis. The closer a section is to the event, or the better the view, the higher the face value assigned to seats in that section. This makes face value a very good, but not perfect, approximation of seat quality.

Within a given section, lower rows are commonly accepted to contain better, more valuable seats than higher rows. In other words, being in a low row should enhance the seat quality attribute of a given ticket. This means that, in the presence of multi-attribute diminishing sensitivity, the interaction term between FV and REC (α_{13} in equation 1.7) should be more strongly negative for tickets in low rows than for tickets in high rows.

In order to evaluate the effect of row, I labeled tickets for seats in rows 10 or lower with the indicator LR, and all other seats with the indicator HR (for High Row). Using these indicators to split the data (and removing the non-contributory REC² term), I re-write the equation 1.7 to include the row effect as follows:

$$(1.8) \quad V = \alpha_0 + \alpha_{111} \cdot FV \cdot LR + \alpha_{112} \cdot FV \cdot HR + \alpha_{121} \cdot FV^2 \cdot LR + \alpha_{122} \cdot FV^2 \cdot HR \\ + \alpha_{131} \cdot FV \cdot LR \cdot REC + \alpha_{132} \cdot FV \cdot HR \cdot REC + \alpha_{21} \cdot REC + \alpha_3 \cdot OD \\ + \alpha_4 \cdot D + \alpha_5 \cdot L + \alpha_6 \cdot SP + \alpha_7 \cdot FA + \varepsilon$$

In equation (1.8), the parameters of interest are α_{131} and α_{132} .

The results of this model, as shown in Table 3, indicate that $\alpha_{131} = -.040$ and $\alpha_{132} = -.011$. An analysis of variance shows this difference to be significant. Therefore, $\alpha_{131} < \alpha_{132} < 0$. This relationship provides further support for multi-attribute diminishing sensitivity between features.

Other Findings

The analyses of actual transaction data that collected from eBay are consistent with the general hypothesis, that a given feature enhancement is most effective in increasing the desirability of those alternatives that have lower levels of other features. Based on multi-attribute utility theory, those alternatives with lower levels of other features would accordingly be lower in total utility, and decreasing marginal utility suggests that a given level of part-worth utility would have a greater effect when added to a generally lower level of total utility.

Other findings related to control variables are of interest as well. For example, the negative effect of lead time bears further discussion. What basis do exists for justifying the relationship between lead times and selling prices that was detected in Equation 1.7? Presumably, buyers have less certainty about their ability to attend an event as the temporal distance between the auction and the event increases. From this standpoint, one should expect selling prices to decrease as temporal distance increases. Also, economic research on hyperbolic discounting implies that, where the cost substantially precedes the benefit in a transaction, consumers will apply a significant discount to the benefit that is not applied to the cost (DellaVigna and Malmendier 2004; Laibson 1997; O'Donoghue and Rabin 1999). Finally, prospect theory tells us that, when faced with a risky choice, consumers are more averse in the domain of losses than they are in the domain of gains (Tversky and Kahneman 1992). As distance between the auction and the event increases, so does uncertainty regarding the performance of teams. Again, this should result in lower prices for temporally distal events.

There is, however, good reason to find this result to be surprising. First, sophisticated buyers may realize that sellers will have fewer opportunities to re-list tickets that do not sell as the time decreases between the auction and the event, so they will offer less. As bidders compete, however, prices should still rise to the value of the second-highest bidder. On the other hand, sellers who are anxious about a ticket remaining unsold may lower the starting price of the auction to entice bidding. Since the starting price is a value cue, this behavior

could reduce the willingness to pay of consumers. Another contributing factor could be that consumers are concerned about not receiving the tickets in time for the event. In this respect, the transaction becomes riskier as the temporal distance gets smaller.

Sellers who paid to have their auctions featured tended to sell their tickets for substantially more than those who did not. One may attribute this to a) increased auction exposure (more potential buyers viewing the auctions), b) the feature serving as a costly signal of quality from the seller to the buyer (Gibbons 1992), c) a tendency among sellers to feature tickets that offer a dimension of quality not captured elsewhere in the regression, or d) some combination of the three. In any case, it appears that paying to have one's auction featured is an economically rational decision since the expected value of featuring the auction is greater than the \$20 fee required to do so. It is perhaps interesting that more sellers do not choose to feature their auctions, although the value of a featured listing decreases with each additional competing featured listing so it could be that some natural equilibrium has occurred.

An analysis of the influence of record on low face-value seats vs. high face-value seats (supporting the multi-attribute diminishing sensitivity hypothesis but not presented here for brevity) sheds further insight into these secondary findings. Where the auction is for tickets of relatively low face-value, the influence of lead time is negative as in Equation 1.7. However, where the tickets have a relatively high face-value, this effect is reversed; greater lead time results

in *higher* selling prices. This suggests that buyers of premium seats may be willing to pay more to lock in their tickets well in advance, while buyers of cheaper seats may only buy tickets in advance where they perceive a bargain.

On average, paying to feature auctions of high face-value tickets results in a selling price increase of about \$87 per ticket. That figure drops to about \$1 in the case of low face value tickets. One may suppose from this that buyers are identifying the featured auction attribute as a costly signal of quality from the seller. This signal makes the buyer more likely to evaluate the ticket. Where the seat quality is consistent with the signal, then increased bidding occurs. Where the seat quality is not consistent with the signal, then no increased bidding occurs.

Conclusions, Limitations and Opportunities for Future Research

I applied the basic theory of marginal decreasing sensitivity across different product features to propose and demonstrate that a given level of feature enhancement increases to a greater extent the desirability of those products with lower levels of other attributes. For example, a breakfast cereal manufacturer could fortify its cereal brands with costly vitamins and minerals. Vitamin fortification would make any cereal brand more desirable, but consumer preferences for the less tasty brands would increase to a greater extent from the same feature enhancement than the more tasty ones.

Future studies may address some of the limitations of this chapter. This research focused on the benefit side of feature enhancements, and addressed specifically the question: which product will become relatively more desirable to the consumer for a given level of feature enhancement? It did not consider the cost side of feature enhancements. The premise was that a given level of feature enhancement would require the same resource investment, and a marketer should allocate that investment to the product that would benefit the most. However, a given level of feature enhancement may be more costly on some products than others. Furthermore, a given level of feature enhancement, say of increasing gas mileage from 20 mpg to 25 mpg, may not be as costly as increasing the gas mileage from 75 mpg to 80 mpg. The laws of diminishing marginal returns may apply on the cost side of feature enhancements.

Nowlis and Simonson provided strong evidence of multi-attribute diminishing sensitivity in a variety of consumer product categories, including sunscreen lotion, binoculars, microwave ovens, camera, and televisions. Here, I show that this effect may be found in experience goods as well. More importantly, I show that multi-attribute diminishing sensitivity occurs in the continuous case, and not only where attributes either exist or do not exist (the discrete case).

In a departure from most previous marketing research involving auctions, I have analyzed data from existing auctions rather than post my own auctions with modulated control variables. Although this approach sacrifices control of

the auction text, general appearance, etc., it does provide a much larger sample size and more realistic conditions. Since determinants of success in online auctions are now fairly well researched, it is possible to isolate many of the factors that require control. Other factors become less important as the sample size increases. In the case of diminishing sensitivity, for example, it is unlikely that these results could be attributable to one set of sellers having more appealing user names or branding than another set of sellers.

Clearly, many important questions remain regarding feature interaction, some of which I discuss in Chapter 2. Other questions are left for future research. For example, it is unclear whether the effect holds where one or more of the attribute values could be negative (in this case, I use the term negative to mean detrimental to the consumer, not merely unacceptable as discussed in Section 2), or where there exists an “ideal” level for a feature, above or below which value decreases. “Investment” goods¹ such as gym memberships would be an example of such a case. (DellaVigna and Malmendier 2004).

Finally, the compromise /extremeness aversion effect presented by Chernev suggests that some interplay exists between diminishing sensitivity and diminishing marginal utility for single attributes (Chernev 2004). Teasing out the nature of this relationship may require greater controls than are achievable using the methods presented herein.

¹ The term “investment good” is used here in the same sense that it is used by DellaVigna and Malmendier, that is, it is a good with a current cost and future benefit.

It is worth noting that in recent years the Red Sox box office has begun charging a small premium for some seats in games against their archrival, the New York Yankees. This is economically rational for a revenue maximizing firm. How much more they should charge within each seating class should not be as simple as a flat rate premium, however. A firm that does not consider diminishing sensitivity when developing differential pricing schemes is likely to suffer from important flaws in their pricing menu.

FIGURES: CHAPTER 1

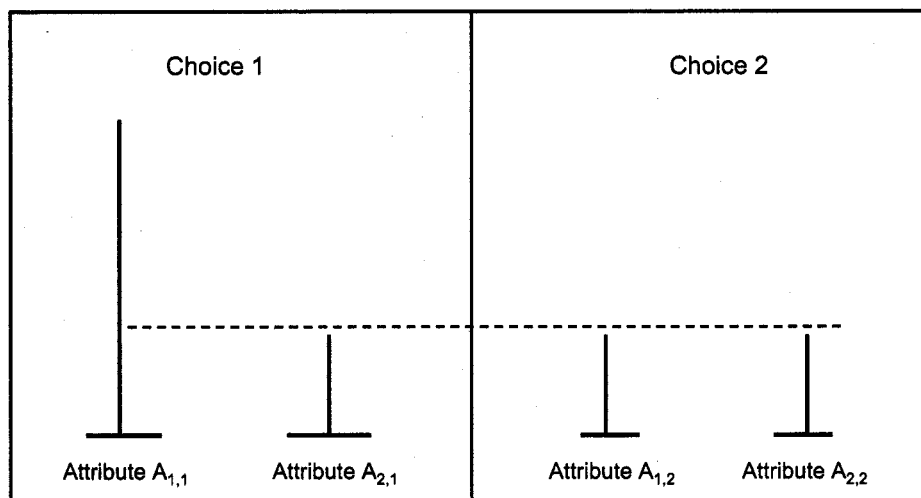


Figure 1. Sample Choice Task 1

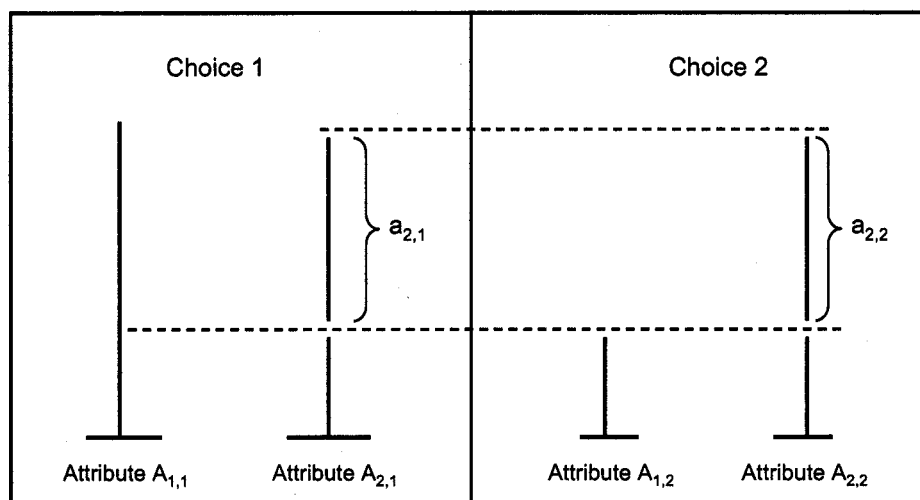


Figure 2. Sample Choice Task 2

TABLES: CHAPTER 1

Table 1. Regression Results

Variable	Equation 1.6	Equation 1.7
Constant	-23.34	-33.8
Face Value	1.22	1.00
Face Value ²	0.01	0.01
Face Value * Weighted Record	-2.93	-2.64
Weighted Record	175.23	203.51
Weighted Record ²	-21.66	-68.48
Auction Density (Same Opponent)	-	-0.48
Auction Density (Any Opponent)	-	0.19
Lead Time	-	-0.07
Starting Price	-	0.27
Featured Auction	-	53.47
R²	0.61	0.67

Table 2: Auction Variables Influencing Selling Price

Variable	Effect
Starting Price (Ariely and Simonson 2003; Gilkeson and Reynolds 2003; Kamins et al. 2004)	Either positive (as value cue) or negative (discourages bidding)
Featured Auction (eBay.com)	Positive
Reference Auctions (Dholakia and Simonson 2005)	Negative
Lead Time (Ariely and Simonson 2003)	Positive

Table 3: Impact of attribute interactions on buyer willingness to pay

Variable	Coefficient	Variable (cont.)	Coef. (cont.)
Constant	6.4		
Face Value (Low Row)	0.61	Face Value (High Row)	-0.01
Face Value2 (Low Row)	0.02	Face Value2 (High Row)	0.02
Face Value * Weighted Record (Low Row)	-0.04	Face Value * Weighted Record (High Row)	-0.01
Weighted Record	68.55		
Auction Density (Same Opponent)	-0.44		
Auction Density (Any Opponent)	0.19		
Lead Time	-0.07		
Starting Price	0.26		
Featured Auction	52.39		

CHAPTER 2: THE REFERENCE DEPENDENCE EFFECT

A product is generally conceptualized as bundle of its attributes or features, and marketers can make their product more desirable to consumers by enhancing its features. Feature enhancements require resources, and marketers face the challenges of improving the quality of their products within a budget. Therefore a brand or product-line manager must prioritize multiple products and decide where to allocate resources for effectuating enhancements. In Chapter 1, I demonstrated that feature enhancements increase the overall desirability of a product, but to a varying degree. In this chapter, I show that enhancement value also depends on the pre-enhancement relative desirability of the product and the consumers' expectations for their product choice. A marketer with multiple products should therefore allocate resources for enhancement to those products that would yield the highest increase in consumer choice.

Theoretical development

I develop the concept of diminishing utility in Chapter 1. According to the principles of diminishing marginal utility in economics, having more of a good is always better, but the value of an additional good decreases as the number of similar goods in one's endowment increases (Bernoulli 1738/1954; Meyer and Johnson 1995).

Diminishing utility applies to product attributes as well. Chapter 1 begins with the example of an increase in the size of a condominium and its impact on the value of small condominium versus a large condominium. The additional space will enhance the value of the small condominium to a greater extent than the large condominium.

Multi-attribute utility theory explains consumers' preferences and choices as a function of products' attribute levels and importance, and presents that a relatively superior/inferior product is characterized by a combination of higher/lower levels of attributes, which sum up to a higher/lower level of total utility (Bettman et al. 1975; Bettman and Zins 1977; Green et al. 1981; Kahn and Meyer 1991; Shocker and Srinivasan 1979). Combined with diminishing utility in product attributes, multi-attribute utility theory suggests that a product would gain the most in its total utility if a given level enhanced its relatively least positive attribute. This concept is highly consistent with the principles of multi-attribute diminishing sensitivity discussed in Chapter 1.

This chapter deals with a boundary condition to the predictions of diminishing utility in attributes: that a product must first meet the consumer's expected levels in all attributes. Like multi-attribute diminishing sensitivity (Nowlis and Simonson 1996), Chapter 1 suggests that feature enhancement will have the greatest positive impact on the overall utility for those products that have lower levels of other attributes. In Chapter 2, I add the proposition that this

happens only when the other attribute levels at least meet the consumer's minimal expectations, which I refer to as their *reference dependence effect*.

Image Theory (Beach and Mitchell 1990; Beach and Mitchell 1987; McAllister et al. 1979) makes strong case for use of thresholds in decision process. Under this framework, decisions consist of two stages: screening and selection. Thresholds based on belief- and goal-based images are used in the screening process. Each threshold violation reduces the likelihood that a candidate option will be included in the consideration set. As with Image Theory thresholds, reference dependence thresholds influence how individuals make choices. The key difference is that Image Theory threshold effects are additive to each other and occur primarily in screening process. Evidence for reference dependence has been found where no screening process is allowed. The effect, as I will show, is similar to that of a substantial discount factor.

This threshold may become established in the mind of the consumer in a number of ways. It has been suggested that, in a new product category, the pioneering brand will set the expectations of the consumer (Carpenter and Nakamoto 1989). Relative to that pioneering brand, and new entrant will be perceived as more risky and will therefore need to provide the consumer with inducements to try their offering. Such inducements may take the form of either reduced pricing or added features at the same price (Schmalensee 1982). The pioneering brand is perceived as acceptable, the entrant brand is below acceptable.

Now, suppose the same new feature could be introduced by either the pioneer or the new entrant. Adding the feature to the pioneering product would enhance the value of the product and increase the consumers' willingness to pay. On the other hand, adding the feature to the follower's product would serve as inducement to try the product, i.e., make it equivalent to the pioneer product in the mind of the consumer, but not necessarily increase willingness to pay. Therefore, the new feature has greater value in the acceptable product.

Meyer and Johnson (1995) convincingly demonstrate that individual feature valuations are highly reference dependent, and that attribute values around that reference point are asymmetric, which is to say that marginal valuations below the reference point are concave while valuations above the reference point are convex. This is conceptually similar to the context dependence of price (Tversky and Kahneman 1981) and loss aversion (Tversky and Kahneman 1991), but generalizes these ideas to non-price features.

The over-weighting of negative information (Meyer and Johnson 1995) suggests that when a feature is found to be substantially below the consumer's reference level, this will result in an inordinate degree of discounting of the value of the product as a whole. Since the marginal negative impact of a feature below the acceptability level will be greater than the marginal positive impact of a feature above the acceptability level, an improvement in a feature at or above the acceptable level will have less of an impact than the improvement of a feature below the acceptable level. Further, since the impact of features on product

value is multiplicative/multilinear, an increase in a feature at or above acceptability will have less of an impact on a product that has another feature below acceptability than on a product where all features are at or above acceptability, because in the former case the product is still unacceptable.

My assumptions about consumer choice combine elements of compensatory models (Green and Srinivasan 1978; Hauser et al. 2006; Johnson and Meyer 1984) and threshold models (Tversky 1972). Among those items that meet the consumer's expectation levels, the relatively inferior alternatives will gain the most in terms of consumer choice for a given level of feature enhancement. However, when an item fails to meet the consumer's expectation levels in one or more of its attributes, it is not a viable alternative. Therefore, enhancing the other features while maintaining those that lie below expected levels would not make the item more desirable to the consumer.

This chapter explores explored the differential effect of feature enhancements using two sets of data. In the study presented here, I conduct an experiment using MP3 players as the product stimulus to analyze reference dependence by measuring people's expectations for attribute levels in addition to their responses to different combinations of attribute levels. These findings were replicated in another study (not presented here) that used hypothetical baseball tickets as the product stimulus.

Study One

If diminishing sensitivity in product attributes held in all cases, relatively more undesirable products would benefit more from new features and feature enhancements (see Chapter 1). However, there are some troubling inconsistencies with that concept.

Consumers often establish cutoff levels for product features, and only those alternatives whose features meet the threshold levels become viable options for choice (Tversky 1972). Therefore, if a feature is enhanced on a product that is below expectations in some important aspect, then that feature enhancement should add less to the overall value of the product than to a product that is acceptable in its important aspects. In the study discussed here, a lab study is used to demonstrate the reference dependence effect, and to test a boundary condition for diminishing sensitivity.

Design:

Data was collected from undergraduate students in two tests, where each test included a series of computer generated choice tasks. 229 subjects participated in the first test, and 298 participated in the second test. The product stimulus was an iPod portable personal MP3 player. This product category was chosen for two reasons. First, it is a relevant category for the subject population. Second, the features of the product are generally straightforward to characterize.

The participants' task was a Choice-Based Conjoint (CBC), among three alternatives of MP3 players, and a "none" option. The MP3 player was described on three dimensions: the size of the hard drive which determines the number of

songs it can hold, the battery life, and whether the product was sold as New (with a warrantee) or Refurbished (with a warrantee). Each participant responded to sixteen choice tasks.

Prior to the choice tasks, participants were asked questions about their actual ownership of MP3 players, as well as the levels that they expected in terms of memory size and the number of songs that a unit could hold, and battery life. They indicated their expectations by choosing from a menu of alternative levels. The goal of this experiment was to evaluate the influence of buyer expectations on product choice and feature attractiveness.

In both tests, the battery life feature varied across three levels: 4 hours, 14 hours, and 28 hours. Condition also varied between New and Refurbished in both tests. Similarly, subjects were asked to characterize their expectations about battery life to be “At least 4 hours”, “At least 14 hours”, “At least 28 hours”, and “More than 28 hours”, and to characterize their expectations regarding the condition of the product as either “New (with a warrantee)” or “New or Refurbished (with a warrantee)”.

In order to provide greater contrast between subject groups, five levels of memory capacity were included in Test 1 (2GB - 500 Songs, 15GB - 3,750 Songs, 30GB - 7,500 Songs, 60GB - 15,000 Songs, 120GB - 30,000 Songs). Eight levels of price were included in both studies (\$79, \$129, \$179, \$229, \$299, \$329, \$399, \$499). In Test 2, the levels of memory capacity were limited to three levels (2GB - 500 Songs, 8GB – 2,000 Songs, and 40GB – 10,000 Songs)

so that they could be matched to subjects' expectations in that feature, which they were asked to characterize as "At least 2GB – 500 Songs", "At least 8GB – 2,000 Songs", "At least 40GB – 10,000 Songs", and "More than 40GB".

Although it has been shown that intentions-based measurements tend to overstate the likelihood of choice (Morrison 1979), this is not overly concerning in the context of this study since I compare relative choice and any bias should affect all options equally.

Two sample choice tasks from Test 1 are shown in Figures 3 and 4. Unless specified otherwise, results discussed below were taken from Test 1.

Results:

A product demand curve was approximated using CBC data by calculating product choice frequency at each price level (Table 4 and Figure 5). In these demand curves, price lies on the X-axis, and frequency of choice lies on the Y-axis. Choice frequency is defined as the number of times a product was chosen at a given price level divided by the number of times the product was offered at that price level. As price is a negative feature and any expenditure decreases product attractiveness (Ding et al. 2005), not surprisingly, choice frequency decreases as price increases.

It is also possible to evaluate the desirability of a product at a given feature level in a similar way. Table 5 and Figure 6, for example, show the aggregate demand for iPods that are sold as New.

The desirability of products at different feature levels were evaluated by comparing their demand curves. Table 6 and Figure 7 show demand for New and Refurbished products separately, across all subjects. A clear preference for the New condition over the Refurbished condition is shown across all price levels. Since the slope for the New condition demand curve is steeper than the slope for the Refurbished condition demand curve, I observe that there is greater price sensitivity for the New product. This is consistent with the reference effect theory, if the respondents expected the condition of the product to be New. If people expect New, Refurbished would lie below their threshold, and therefore enhancing the price by decreasing price would not necessarily increase choice frequency.

An analysis of the expectations of the respondents reveals that the large majority (87%) of respondents indeed expected the condition of an iPod that they would purchase to be New. An analysis of demand for the 38 respondents that selected Refurbished as an acceptable condition shows nearly identical demand curves for both conditions (Table 7 and Figure 8). This suggests that respondents who expected Refurbished were unwilling to pay more for an improvement in condition. For the great majority of respondents who expected New, an enhancement in price, i.e. a lower price, increased purchase frequency to a greater extent when the condition met their expectations (i.e. was New) than when the condition lay below their expectations (Table 7 and Figure 9).

As shown in Table 8 and Figures 10 – 12² these findings were consistent across the memory capacity feature as well. The differences in demand between groups were significant at $p < .01$.

Up to this point, price has been used as a product attribute. It has been shown how an improvement in price increases choice frequency to a greater extent when the product's other attributes meet or exceed people's expectations. In order to determine the effect of reference dependence on non-price features, sensitivity to changes in song capacity was evaluated at different levels of expected battery life.

As Table 9 and Figures 13 – 15 show, improvements in memory capacity increases choice frequency to a greater extent for products that are acceptable in battery life than for products that are not acceptable in battery life. Differences between groups are significant at $p < .01$.

Discussion

The results of Chapter 2 would argue against developing a product that is overly dependent on a single attribute. Although it may be true that consumers will believe a feature to be superior when it is the primary product attribute than when it is one of several attributes (Chernev 2007), this research shows that, in order for an attribute to be fully valued, all other product features must meet

² Memory capacity expectations were not matched to conjoint feature level options in Test 1, so these tables and charts were derived from the results of Test 2.

consumer expectations. Compensatory reasoning or zero-sum heuristics cannot mitigate attributes that fall below expectations (Chernev 2007). To return to another example used in Chapter 1, a breakfast cereal manufacturer could fortify its cereal brands with costly vitamins and minerals. Vitamin fortification should make any cereal brand more desirable, even if that cereal has a poor taste attribute. However, there is a limit as to how “not tasty” a brand can be before the vitamin fortification is discounted. That is, few consumers will buy a cereal that tastes bad, no matter how many more vitamins it may have.

This chapter also in part explains the discrepancy between multi-attribute diminishing sensitivity and the documented preference that people have for products with “balanced” attributes, as discussed in Chapter 1. When attributes are rated on a 100 point scale, a two-attribute product that scores (60, 60) is preferred to those that score (50, 70) or (70, 50), as the former is more balanced in the attributes (Chernev 2004). In this research, I consider actual products and product attributes such as memory and battery life of a portable mp3 player, rather than hypothetical attribute 1 and attribute 2. Scaling the attribute levels to 100 points, rather than using absolute attribute levels such as 2 versus 8 gigabytes of memory (as is done here), would have a similar effect to referencing. On a 100-point scale there would presumably be a tendency for people to look at the higher middle range as a reference, with 50 being the mid-point, and 70 being a common passing grade for tests. Therefore for a mean-preserving distribution of attribute levels scaled to 100, those combinations

where one attribute falls below the higher middle range would be less preferred thus demonstrating a balanced attribute effect.

It has been suggested that consumers tend to agglomerate product features into a single “meta-attribute” of quality (Green and Srinivasan 1978; Kivetz et al. 2004; Wright 1975). The results presented in this chapter suggests that there may be limits in the extent to which features may serve as substitutes for each other, and are integrated into the total utility of a product.

Consumers’ responses to feature enhancements differ depending on whether or not a product met reference levels of expectations in its other features. This interdependence between features has important implications for product updates and for market pioneering. As a firm updates their product offerings, it would benefit from an evaluation of consumer expectations in all features before upgrading any single feature.

Also, since consumers appear to set their preferences based on pioneer products (Carpenter and Nakamoto 1989), the threshold effect could help explain the market share difference enjoyed by pioneers. Although some literature suggests that pioneers of incrementally new products are more successful than those of radically new products (Min et al. 2006), the threshold effect should provide greater benefit for radical innovators.

This chapter has presented consumers’ expectations as a boundary condition for the basic principles of multi-attribute diminishing sensitivity. A future study may investigate how marketers can change consumers’ expectation

levels for product features. Based on reference dependence, this would enable them to change the slope of demand curve for the entire product.

It has been shown elsewhere that firms may benefit from understating quality in advertising under certain conditions – when customers are believed to be highly sensitive to the difference between actual and expected quality, do not discount advertised quality, have a low base level of satisfaction, and when repeat sales are especially important to the firm (Kopalle and Lehmann 2006). In other cases, overstating quality in advertising will be optimal. The reference dependence effect may help explain these findings. When advertising sets the acceptable level of quality in a given feature and the consumer experience with the product does not meet that level of quality, then the other product features will be substantially discounted and future purchase likelihood will decrease. If, however, the decision about feature acceptability relative to a preexisting threshold is made based on advertised quality, then purchase likelihood will increase from overstatement if advertised quality is above the quality threshold. Where quality is difficult to evaluate through product experience, this need not have a negative effect on future purchase likelihood.

In this chapter, I did not explicitly distinguish between those attributes that may be more important versus less so. Another direction for future studies is to differentiate among the different product attributes by importance. For example, it is quite possible that more important features will have a stronger reference effect than less important features (Chernev 2003). Furthermore,

feature enhancement on a product that has the lowest level of the most important attribute may benefit from the most incremental gain in consumer choice.

FIGURES: CHAPTER 2

Which one would you purchase from this set?
Choose by clicking one of the buttons below

Refurbished 8GB - 2,000 Songs Up to 28 hours of music playback on battery charge \$499	Refurbished 40GB - 10,000 Songs Up to 14 hours of music playback on battery charge \$129	New 2GB - 500 Songs Up to 6 hours of music playback on battery charge \$79	NONE I wouldn't choose any of these.
-------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------	-----------------------------------------------

Figure 3: 3-item Choice Task (A)

Which one would you purchase from this set?
Choose by clicking one of the buttons below

New 2GB - 500 Songs Up to 14 hours of music playback on battery charge \$329	New 4GB - 10,000 Songs Up to 28 hours of music playback on battery charge \$179	Refurbished 8GB - 2,000 Songs Up to 4 hours of music playback on battery charge \$399	NONE I wouldn't choose any of these
-----------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------	----------------------------------------------

Figure 4: 3-item Choice Task (B)

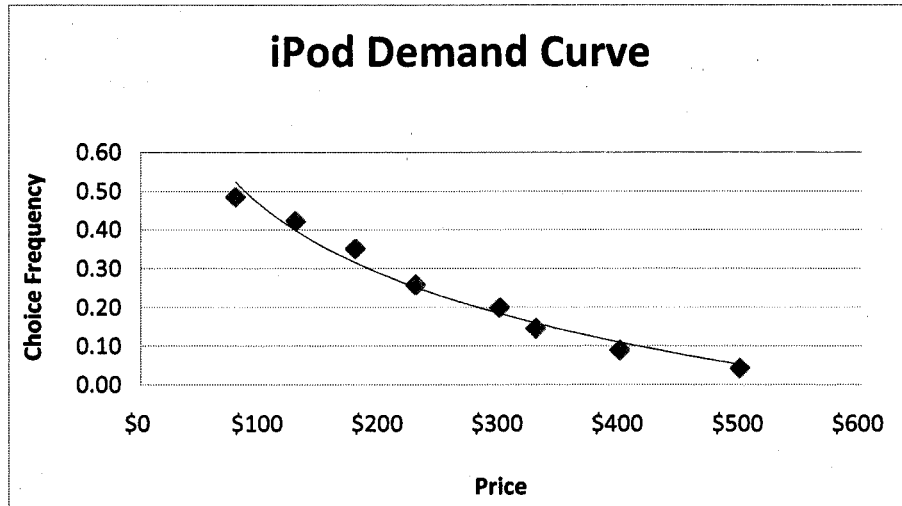


Figure 5: Demand Curve for iPods

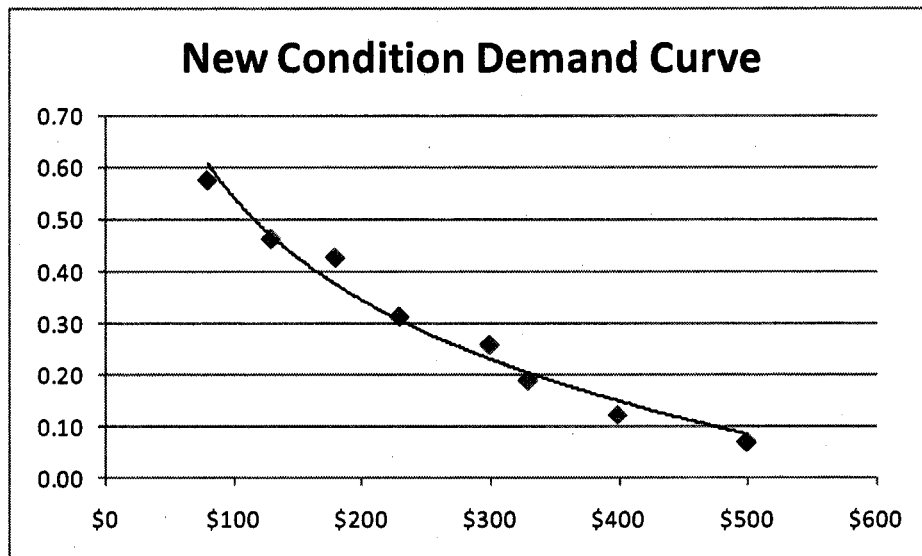


Figure 6: Demand curve for iPods sold as New

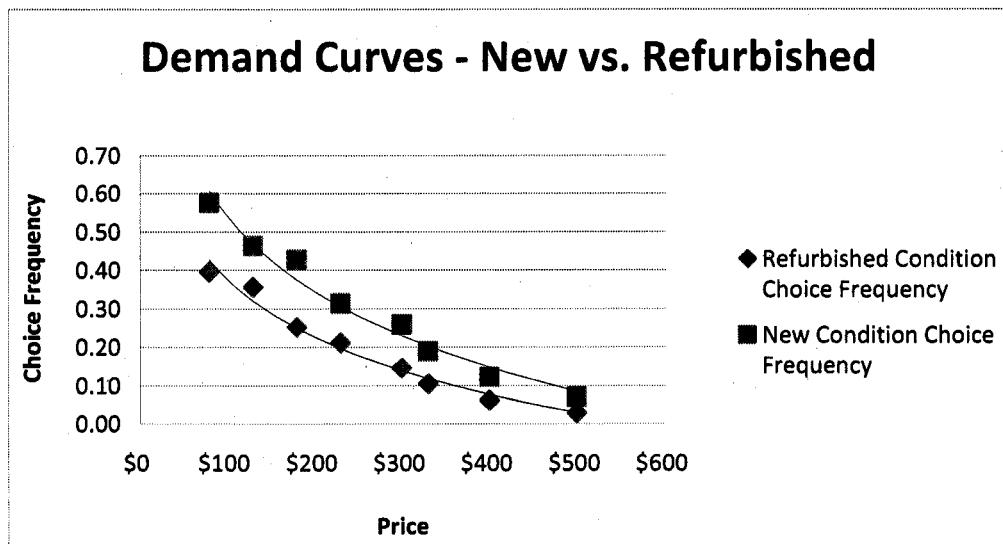


Figure 7: Demand Curves for iPods sold as New and iPods sold as refurbished

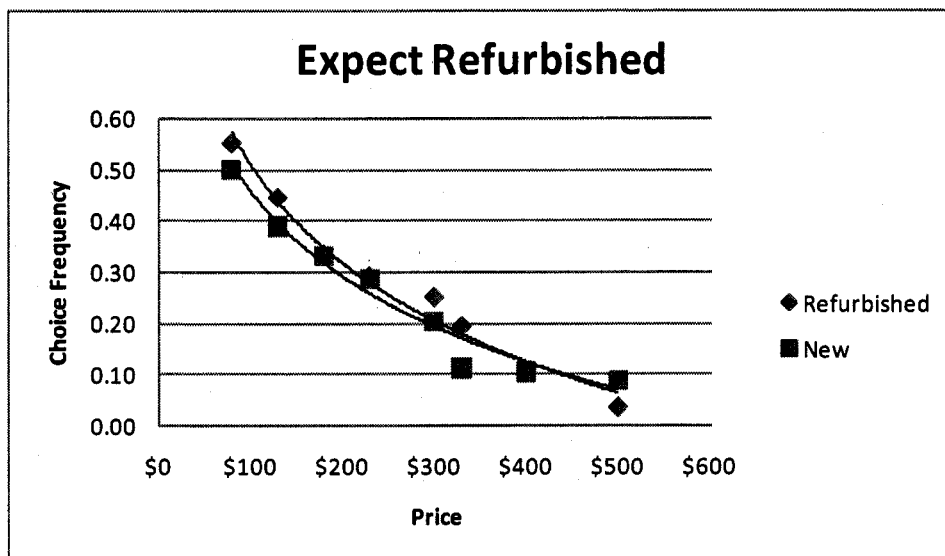


Figure 8: Demand curves for iPods sold as New and iPods sold as refurbished for subjects that identified either Refurbished or New condition as acceptable

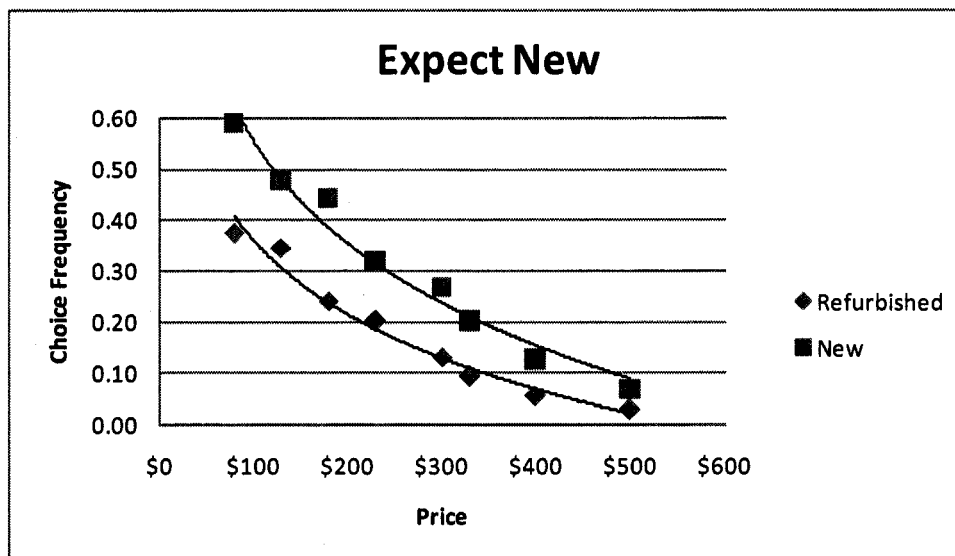


Figure 9: Demand curves for iPods sold as New and iPods sold as refurbished for subjects that identified New condition only as acceptable

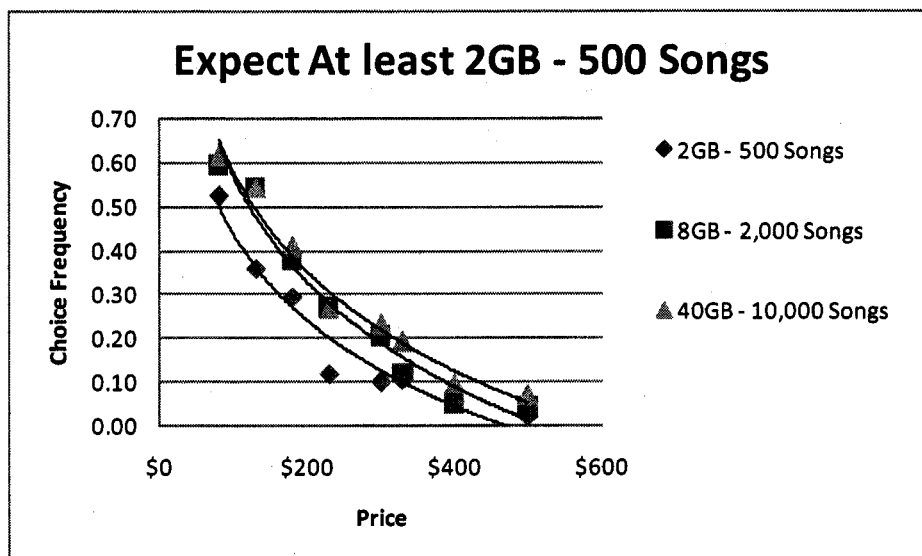


Figure 10: Demand curves for iPods separated by song storage capacity for subjects that identified 2GB or more of memory as acceptable

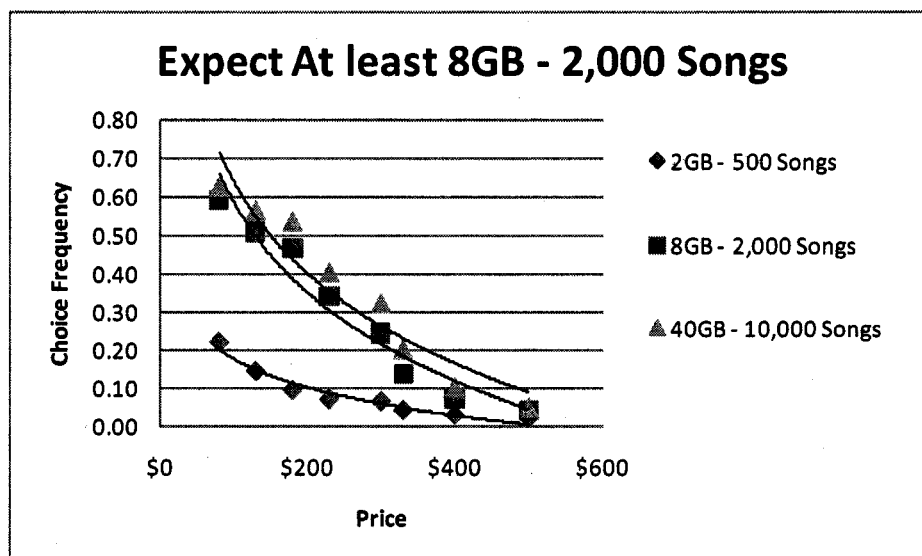


Figure 11: Demand curves for iPods separated by song storage capacity for subjects that identified 8GB or more of memory as acceptable

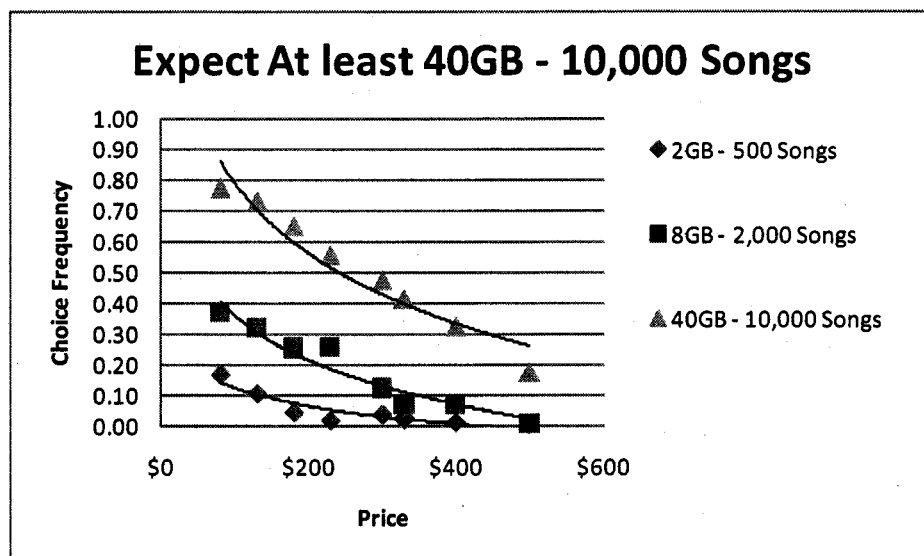


Figure 12: Demand curves for iPods separated by song storage capacity for subjects that identified 40GB or more of memory as acceptable

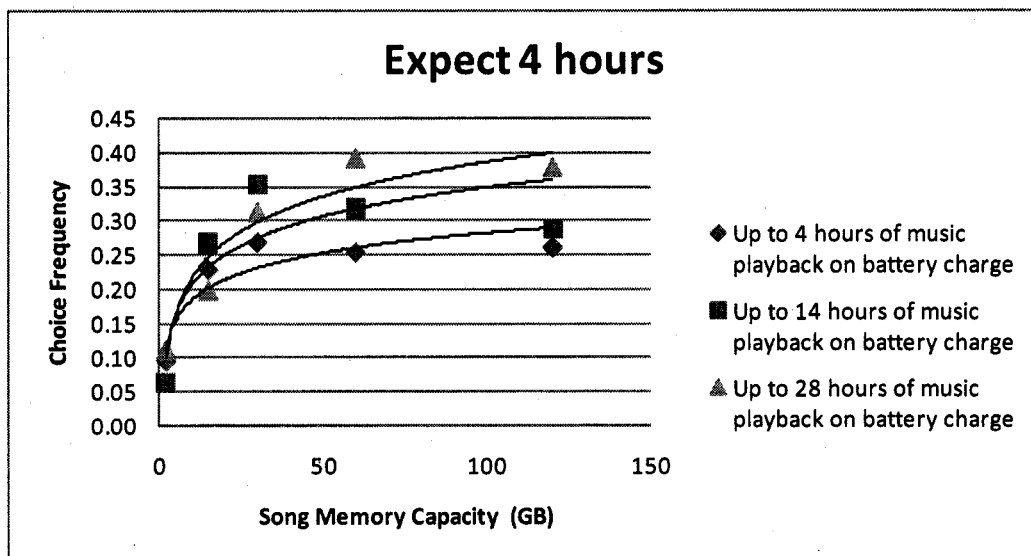


Figure 13: Demand for iPods at different levels of song storage capacity and separated by battery life for subjects that identified 4 hours or more of battery life as acceptable

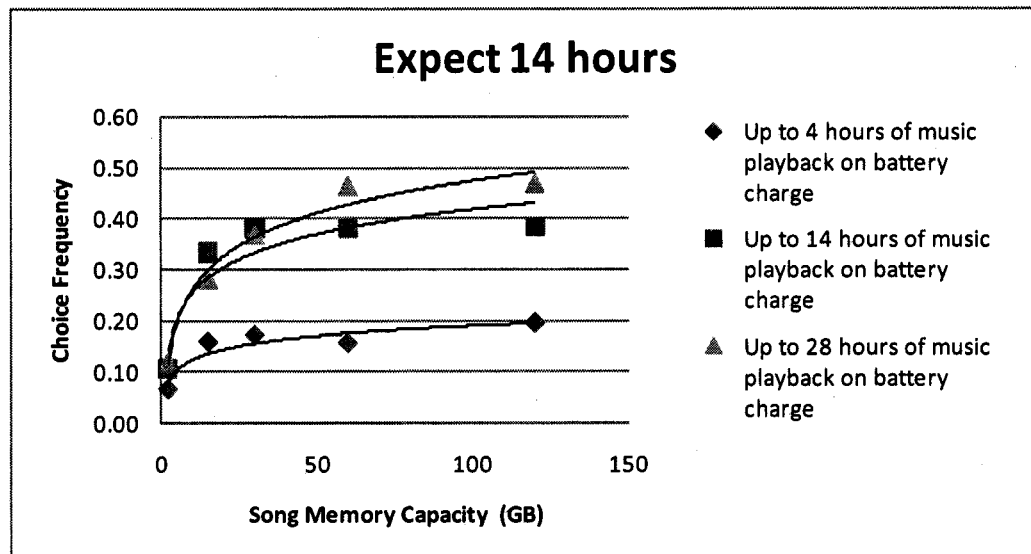


Figure 14: Demand for iPods at different levels of song storage capacity and separated by battery life for subjects that identified 14 hours or more of battery life as acceptable

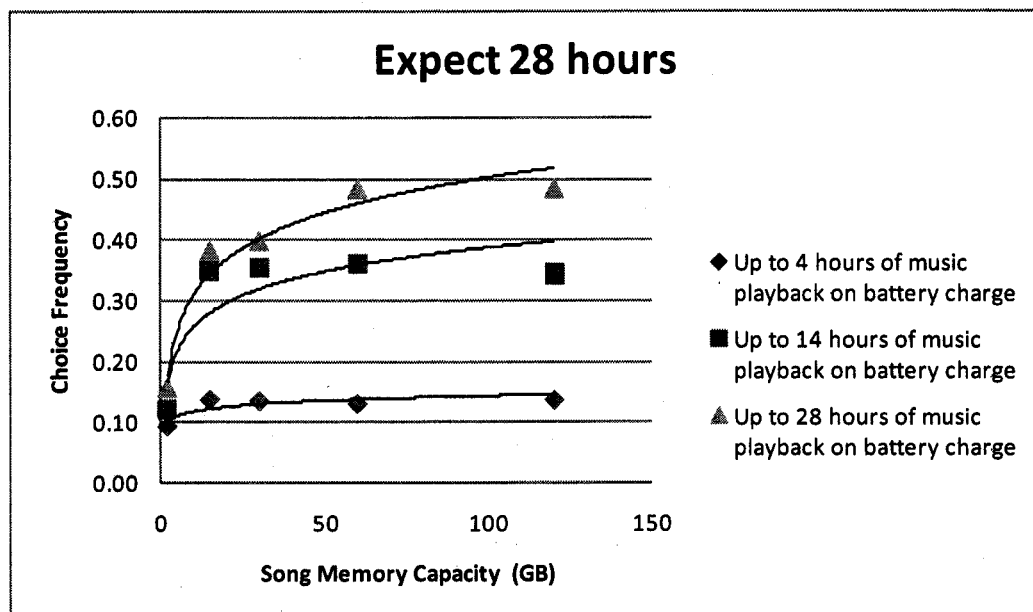


Figure 15: Demand for iPods at different levels of song storage capacity and separated by battery life for subjects that identified 28 hours or more of battery life as acceptable

TABLES: CHAPTER 2

Table 4: Choice Frequency for iPods by Price Level

Price	Choice Frequency
\$79	0.48
\$129	0.42
\$179	0.35
\$229	0.26
\$299	0.20
\$329	0.15
\$399	0.09
\$499	0.04

Table 5: Product choice frequency for each price level, New products only

Price	Choice Frequency
\$79	0.58
\$129	0.46
\$179	0.43
\$229	0.31
\$299	0.26
\$329	0.19
\$399	0.12
\$499	0.07

Table 6: Product choice frequency by price, New vs. Refurbished products

Price	Refurbished Condition Choice Frequency	New Condition Choice Frequency
\$79	0.40	0.58
\$129	0.36	0.46
\$179	0.25	0.43
\$229	0.21	0.31
\$299	0.15	0.26
\$329	0.11	0.19
\$399	0.06	0.12
\$499	0.03	0.07

Table 7: Product choice frequency by price, New vs. Refurbished products, separated by the expectations of the subjects

Price	Expect Refurbished		Expect New	
	Refurbished Choice Freq.	New Choice Freq.	Refurbished Choice Freq.	New Choice Freq.
\$79	0.55	0.50	0.37	0.59
\$129	0.45	0.39	0.34	0.47
\$179	0.33	0.33	0.24	0.44
\$229	0.29	0.29	0.20	0.32
\$299	0.25	0.21	0.13	0.27
\$329	0.19	0.11	0.09	0.20
\$399	0.10	0.11	0.06	0.13
\$499	0.03	0.09	0.03	0.07

Table 8: Product choice frequency by price and song storage capacity, separated by the expectations of the subjects

Price	Expect At least 2GB - 500 Songs			Expect At least 8GB - 2,000 Songs			Expect At least 40GB - 10,000 Songs		
	2GB - 500 Songs	8GB - 2,000 Songs	40GB - 10,000 Songs	2GB - 500 Songs	8GB - 2,000 Songs	40GB - 10,000 Songs	2GB - 500 Songs	8GB - 2,000 Songs	40GB - 10,000 Songs
\$79	0.52	0.59	0.61	0.22	0.59	0.63	0.17	0.37	0.77
\$129	0.36	0.54	0.54	0.15	0.51	0.56	0.10	0.32	0.73
\$179	0.29	0.38	0.41	0.10	0.47	0.54	0.04	0.25	0.65
\$229	0.12	0.27	0.27	0.07	0.34	0.40	0.02	0.26	0.55
\$299	0.10	0.20	0.23	0.07	0.24	0.32	0.04	0.12	0.47
\$329	0.11	0.12	0.19	0.04	0.14	0.20	0.02	0.07	0.41
\$399	0.06	0.05	0.10	0.03	0.07	0.10	0.01	0.07	0.32
\$499	0.02	0.04	0.07	0.03	0.04	0.05	0.01	0.01	0.17

Table 9: Product choice frequency by battery life and song storage capacity, separated by the battery life expectations of the subjects

Memory Capacity	Expect at least 4 hours of music per charge			Expect 14 hours of music per charge			Expect 28 hours of music per charge		
	Up to 4 hours of music per charge	Up to 14 hours of music per charge	Up to 28 hours of music per charge	Up to 4 hours of music per charge	Up to 14 hours of music per charge	Up to 28 hours of music per charge	Up to 4 hours of music per charge	Up to 14 hours of music per charge	Up to 28 hours of music per charge
2GB - 500 Songs	0.09	0.06	0.11	0.07	0.11	0.12	0.09	0.12	0.16
15GB - 3,750 Songs	0.23	0.27	0.20	0.16	0.33	0.28	0.14	0.35	0.38
30GB - 7,500 Songs	0.27	0.35	0.31	0.17	0.38	0.37	0.14	0.35	0.40
60GB - 15,000 Songs	0.25	0.32	0.39	0.15	0.38	0.46	0.13	0.36	0.48
120GB - 30,000 Songs	0.26	0.29	0.38	0.19	0.38	0.47	0.14	0.34	0.48

CHAPTER 3: THE ROLE OF REGULATORY FOCUS IN PRODUCT INNOVATION AND BRAND VALUE

Continuous development of new features is essential in competitive markets in order to differentiate product offerings from competing products (Tholke et al. 2001). However, developing and commercializing such features requires the long-term commitment of scarce resources. Additionally, adding new features to a product can place a firm at a serious competitive disadvantage in terms of cost. Where and when to allocate new features is therefore one of the most important marketing decisions a firm can make.

When firms conduct market research to evaluate the effect that a new feature will have on consumer product preference and willingness-to-pay, they do not, in general, consider the self-regulatory goals within target groups of consumers. This paper examines how self-regulation systems among target groups of consumers influences their evaluation of innovative features in established products, and how brand quality asymmetrically influences these evaluations.

According to regulatory focus theory (Higgins 1997), goals may be classified within two general categories: ideals (e.g., hopes and aspirations) and oughts (e.g., responsibilities and obligations) (Higgins 1987; Pham and Avnet 2004). These two categories each operate within a distinct regulatory system. Ideals operate within an individual's promotion regulatory system, and oughts

operate within an individual's prevention regulatory system. These systems control the strategies individuals use to achieve desired end states. Individuals who are oriented toward their promotion regulatory system will reference potentially positive outcomes in choice and tend more toward "eagerness" or "approach" strategies to maximize the likelihood of achieving the positive outcome. On the other hand, individuals with a relatively strong prevention orientation will focus on the potentially negative outcomes and tend more toward "vigilance" or "avoidance" strategies in choice behavior (Higgins 1997; Higgins 2002; Markman and Brendl 2000).

Although individuals will tend to be chronically either more promotion-oriented or more prevention-oriented in their choice behavior, both regulatory foci exist to a greater or lesser extent in everyone. As Herzenstein et al. state, regulatory focus "is both an individual difference and contextually malleable" (Herzenstein et al. 2007). Either orientation may be activated by the circumstances under which the choice is made.

Several studies have demonstrated that self-regulation orientation influences choice and purchasing behavior. Chernev (2004) shows that consumers have a preference for products with features that are aligned with their regulatory focus. Promotion-oriented individuals, for example, have a greater preference for products with hedonic- and performance-related features than prevention-oriented individuals, whereas prevention-oriented individuals have a relatively greater preference for utilitarian- and reliability-related features.

Individuals with a prevention orientation are also more susceptible to compromise effects (Simonson 1989) in choice behavior than are individuals with a promotion orientation (Mourali et al. 2007). In that preference for options with moderate features over options with extreme features can be construed as risk-averse behavior, this finding is consistent with the belief that prevention-oriented individuals are more prone to engage in vigilance strategies of choice. Promotion-oriented individuals appear more sensitive to attraction effects (Ariely et al. 2005; Mourali et al. 2007).

Markman and Brendl (2000) find evidence that information used in making a choice is filtered through the active goal-orientation of the decision maker. Similarly, Aaker and Lee (Aaker and Lee 2001) show that information is more persuasive where it is consistent with the chronically or temporarily activated self-view of the evaluator. They align an independent self-view with promotion orientation, and an interdependent self-view with prevention orientation.

Zhang and Mittal (2007) also align promotion orientation with independent self-construal and prevention orientation with interdependent self-construal. Like Mourali et al., they show that individuals with a promotion orientation and independent self-construal place greater value on “enriched” options (i.e., those that include features with very high and very low values) and individuals with a prevention orientation and independent self-construal tend to

place greater value on “impoverished” options (those that include features with more average values).

Promotion-oriented individuals have been shown to be more open to change than prevention oriented individuals, supporting the idea that promotion oriented individuals would be more prone to adopt innovations (Chernev 2004; Liberman et al. 2001).

When evaluating a new feature in an existing product, the value of that feature is highly dependent on the other characteristics of the product to which it is added. For example, the equity of the product brand will influence the expected quality of the feature.

The central proposition of this paper is that self-regulation orientation will influence consumer evaluations of new features and brands in existing products. Where target consumers are relatively promotion-oriented (such as very early in a technological product’s lifecycle), new or relatively weak brands will benefit more than relatively strong brands from the introduction of new features. This is because the new uses and capabilities provided by the new features will be highly salient to promotion-oriented consumers, and engagement in eagerness choice strategies will dictate that they evaluate the feature. Brand quality, on the other hand, will be less salient to these individuals since this attribute provides less direct potential benefits. A strong level of brand equity will indirectly enhance the value of all features in a product, not just the new feature, so adding the new feature to a product with a high quality brand will

result in diminished sensitivity to the new feature relative to the case where the feature is added to the low quality brand (Nowlis and Simonson 1996).

This does not suggest that brand equity does not contain value to promotion-oriented consumers. Promotion-oriented consumers are susceptible to brand-comparison advertising (Jain et al. 2006; Jain et al. 2007), particularly when one brand claims to outperform another brand in a specific characteristic, such as toothpaste cavity prevention, or when the comparison is positively framed. Brand should in fact be more salient than price for an individual engaged in an eagerness choice strategy, since brands carry certain hedonic characteristics of value to promotion-oriented individuals (Voss et al. 2003), whereas the benefits of lower price are indirect and utilitarian (Chernev 2004). Where the difference in price is not too large, promotion-oriented individuals should be more likely to pay more for a relatively high quality brand than other individuals.

Where target consumers are relatively prevention-oriented, relatively weak brands will not benefit more than strong brands from the introduction of new features. Since prevention-oriented individuals are prone to engage in vigilance strategies of choice, they will be more sensitive to price and utilitarian brand characteristics such as quality than promotion-oriented individuals. They will also be more prone to discount the value of innovative features, since uncertainty about the value of these features will be highly salient under a prevention orientation. When prevention-oriented individuals are forced to

choose between lower price and brand quality, risk aversion will result in a tendency to favor lower price, since this will avoid the certain loss of money.

The distinction between new products and new features in existing products is significant. Although at least one prior study has investigated how self-regulation orientation influences decisions regarding innovative products (Herzenstein et al. 2007), no research has yet investigated the question of how regulatory focus influences consumers reaction to innovative improvements in existing products. Improvements considered here are those that Okada (2006) refers to as “non-alignable enhancements” (i.e., completely new features rather than improvements to existing attributes). They are also highly innovative in the sense that they are difficult to evaluate based on prior experience.

Herzenstein et al. (2007) show that new and really new products (i.e., those products that do not fit in existing categories) are more likely to be owned by promotion-oriented consumers than prevention-oriented consumers. Once a product becomes established, however, there is no difference in probability of ownership based on regulatory focus. These findings imply that early in an innovative product’s lifecycle, the preponderance of customers will be those with a relatively high promotion self-orientation and relatively low prevention self-orientation. Since there is no difference in ownership probability for established products (i.e., those that are no longer new), their findings further suggest that prevention-oriented individuals are more likely to be first-time buyers when products have been well-established in the marketplace, i.e., once the product

lifecycle has reached maturity. In these mature product categories, prevention-oriented individuals will provide a key source of business growth. This pattern of goal-orientation in new product adoption is represented in Figure 16.

One can imagine the case of a firm that attempts to introduce a product in a new category in which no other firm has established itself. Should the brand fail to achieve a high level of initial acceptance, the firm could improve on the acceptance of follow-up versions by enhancing the product with an innovative feature. The innovative feature may be particularly attractive to initial consumers since highly promotion-oriented individuals dominate the primary target market at this stage.

A fast follower may also benefit from a strategy that includes the introduction of an innovative feature as a means of mitigating the pioneering advantage enjoyed by the incumbent firm. If the innovation is costly, a profit-maximizing incumbent may choose not to maintain feature parity, opting instead to reduce the product price or to develop other features instead.

In the case of a mature product, firms hoping to grow the market for a product will do so by appealing to prevention-oriented consumers. New features will do less to attract these customers than they will have done to attract promotion-oriented consumers. Price reductions or improvements to perceived quality through promotion may provide greater benefit in this case.

The Determinants of Feature Value

When considering a product for purchase, consumers compare the tagged price of that product to some subjective reference price. Products that are priced below the reference price are considered attractive, whereas products priced above the reference price are considered unattractive. In general, the reference price for a new feature will be non-negative. Consumers use two types of reference price when evaluating a purchase: stimulus-based and memory-based. Stimulus-based reference prices are formed at the time of evaluation based on available cues such as the shopping environment and observed prices for similar products.

Consumers can be said to construct their memory-based reference value for a product based on their prior experience with that product. Experience is not generally informative in the case of really new products, so consumers will rely more on stimulus-based reference prices instead. These stimulus-based reference prices are generated at the time of evaluation and are largely a function of environmental cues, including characteristics of the store and observed prices of similar products (Briesch et al. 1997; Hardie et al. 1993; Rajendran and Tellis 1994).

When a consumer evaluates a new feature, the product itself will provide a strong environmental cue for the feature reference price. The distribution from which this reference price is drawn will be shifted by the perceived quality of the product that contains it, and by the value of the existing features in the product.

Consumers familiar with a given product will base their reference price for that product largely on the remembered price for that product, as in Figure 17 (c.f., Hardie et al. 1993; Niedrich et al. 2001).

When the consumer evaluates the product on a new purchase occasion, she will compare the current observed price to the reference price. If the current price is above the reference price, this will negatively affect the evaluation. If the current price is below the reference price, this will positively affect the evaluation.

Now, suppose that a new feature is added to the product. The reference price will then be updated to include the estimated value of the new feature, as in Figure 18.

A positive or complementary (Chernev 2005) new feature added to a product will increase the expected price of that product by some amount. How much the expected price increases will depend not only on the value of the enhancement per se, but also on the perceived value of the unenhanced product and the expected quality of the feature (Nowlis and Simonson 1996). The perceived value of the unenhanced product will, of course, be closely tied to the previously observed price.

Standard economic theory argues for a concave value function, implying diminishing marginal utility as an individual's endowment in a good increases (c.f., Bernoulli 1738/1954; Meyer and Johnson 1995). Further, multi-attribute utility theory explains consumer preference as being a function of the levels of

quality of the various product attributes (Bettman et al. 1975; Bettman and Zins 1977; Green et al. 1981; Kahn and Meyer 1991; Love and Okada; Shocker and Srinivasan 1979). The incremental increase in value provided by the new feature will be smaller in a product with a large amount of pre-existing value than in a product with a small amount of pre-existing value. This negative influence of pre-existing value is captured in Figure 4.

Keller defines customer-based brand equity as “the differential effect of brand knowledge on consumer response to the marketing of the brand,” and characterizes a brand as having a “positive (negative) customer-based brand equity if consumers react more (less) favorably to the product...of the brand than they do to the same marketing mix element when it is attributable to a fictitiously named or unnamed version of the product” (Keller 1993). Fundamentally, the same feature will be valued more highly when it is associated with a strong brand than when it is associated with a weak brand. Consumers will have a more inelastic response to the increase in price of a product with a strong brand than in a product with a weak brand (Keller 1993).

From an economic standpoint, a brand may be understood as a costly signal of quality (Akerlof 1970). It is therefore rational that consumers should infer higher product quality from higher brand quality. Dodds, Monroe, and Grewal found brand to be a significant positive indicator of perceived product quality, where perceived quality is measured on the dimensions of reliability, workmanship, general quality, dependability, and durability (1991). Brand also

had a positive impact on perceived value. Rao and Monroe similarly found a positive relationship between brand and quality in their meta-analysis of research on the effects of price, brand name, and store name on product quality (2002). Many other studies have identified brand as an important extrinsic cue of product quality expectations (c.f., Ding et al. 2005), a stronger cue, in fact, than product price (Dodds and Monroe 1985; Jacoby et al. 1971) or store quality (Dodds et al. 1991).

The quality of the brand is an important signal regarding the expected quality of the new feature. New features in products with high quality brands will be expected to be of higher quality than the same new features in low quality brands. Strong brands enhance the expected value of new features. Strong brands also enjoy a price premium, so the value of the unenhanced product will have increased with the quality of the brand as well. This means that brand will have both a positive main effect and a negative indirect effect (mediated by the value of the unenhanced product) on the value of the new feature. These effects may be observed in Figure 19.

The value of the feature per se will vary from individual to individual based on how well that feature fits their needs, and will also vary systematically based on the individual's self-regulatory focus at the time of evaluation. As Markman and Brendl (2000) show, the value of an object is a function of its compatibility with the active goal of the individual making the evaluation. For

individuals accessing their promotion orientation, this value will be amplified by their visualization of the usefulness of the feature.

An individual's level of accessible prevention orientation will influence the perceived value of the new feature as well, albeit in a more complex manner. According to Herzstein et al. (2007), individuals with a high prevention orientation are less likely to buy really new products because they are more sensitive to the high performance risk of such products. This uncertainty causes them to discount the value of the product. This discounting effect can be expected to apply to evaluations of new features as well.

Since this discounting effect is based on performance uncertainty, individuals with an activated prevention orientation will also be more sensitive to signals of quality assurance such as brand. This suggests that brand equity will have a moderating effect on the negative relationship between prevention orientation and new feature value, as in Figure 20.

The following hypotheses may be derived from this model:

H1a. Promotion-oriented individuals will expect to pay more for innovative features than non-promotion-oriented individuals where brand equity is low. Prevention-oriented individuals will expect to pay less for innovative features than non-prevention-oriented individuals where brand equity is low.

A higher promotion orientation will result in greater attribution of value to the new feature. Higgins (2002) aligns eagerness with a promotion orientation, where eagerness involves seeking to avoid errors of omission. In this

case, eagerness would result in higher purchase likelihood of products with new features. Individuals with a high promotion self-orientation have in fact been shown to respond favorably to innovative products through early adoption and relatively high self-reported purchase likelihood (Herzenstein et al. 2007). One may infer from this that such individuals are similarly responsive to feature innovation, that is, their evaluation will focus on the opportunities provided by the innovation rather than the risks associated with the innovation, or with the product in general.

Since promotion-oriented consumers will be less sensitive to quality signals than prevention-oriented consumers, the negative interaction effect between the value of the previously observed product and the new feature will outweigh the positive impact of quality on the value of the new feature. Brand will have a diminished effect on expected value because sensitivity to brand is low and the interaction between the value of the pre-existing features and the new feature is high (Ding et al. 2005; Dodds and Monroe 1985; Dodds et al. 1991; Jacoby et al. 1971). This is also consistent with the findings of Nowlis and Simonson (1996), who demonstrate that an improvement to a low quality product increases the value of that product to a greater extent than an identical improvement to a high quality product in the same category. This effect, which they label multi-attribute diminishing sensitivity, is found in a wide variety of consumer products. Diminishing marginal utility implies that highly promotion oriented individuals will value the addition of the innovative feature to the low-quality product more than the same addition to the high quality product.

H1b. Prevention-oriented individuals will expect to pay more for improvements in brand quality than promotion-oriented individuals.

For highly prevention-oriented individuals, brand will have both a positive main effect and a positive moderating effect with prevention orientation. These dual effects will tend to outweigh the negative effect that brand has through the mediator of previously observed price.

Herzenstein et al. (2007) argued that individuals with high prevention orientation tend to place greater emphasis on the potential risks of adopting an innovative product than they place on the potential advantages that innovations may provide. This same risk emphasis should apply to product features as well as products. Since low quality products will in general offer a greater performance risk than high quality products, low quality products with innovative features are more likely than high quality products with innovative features to be considered unacceptably risky.

There exists an inherent performance risk in any innovation due to the uncertainty about how the innovation will actually perform relative to how it is expected to perform. This uncertainty makes it difficult for consumers to establish an appropriate reference price for the innovation.

The perceived riskiness of an innovative feature is determined by the performance uncertainty that an individual has with respect to the feature. This uncertainty is enhanced where the brand of the product to which the innovative feature is added is perceived as having relatively weak or low brand equity. It is

also enhanced where the individual has a relatively high prevention orientation. These two factors, the brand equity and the individual's prevention orientation, will jointly influence the degree to which the perceived value of the feature is discounted due to risk.

Study 1

This study evaluates the influence of consumer self-regulation orientation on price expectations for new product features and for varying levels of brand equity. I compare how elicited feelings of promotion-orientation and prevention-orientation affect consumer preferences for a common computer peripheral from either a well-known, high equity brand or an unknown, low equity brand. As promotion orientation often leads to eagerness and a desire to avoid errors of omission, I anticipate that promotion-elicited participants will be willing to pay more for an existing product with an innovative feature than prevention-elicited participants. I also anticipate that prevention-elicited participants, who respond more to brand cues of quality and are concerned more with the risks of innovation than its benefits, will be willing to pay more for an increase in brand equity than promotion-elicited participants.

Method

279 participants were randomly selected by the market research firm, Answers Research and were compensated with reward points for their participation. All participants were between 30 and 64 years of age, were

computer owners, and had broadband internet access. 60% were female.

Subjects participated in the study via a web-based survey tool. Participants were randomly assigned to one of twelve conditions based on a 2 (Brand Equity: Low or High) x 2 (Product: Unenhanced or Enhanced) x 3 (Regulatory Focus: High Promotion, High Prevention, or Control) factorial design.

Using the essay writing exercises employed by Freitas and Higgins (2002), Higgins (2002) and Higgins et al. (1994), participants' temporary regulatory focus were activated based on the condition in which the subject was assigned. This manipulation is very similar to the manipulation validated and used by Pham and Avnet (2004). Participants that were primed for the high promotion (prevention) condition were given the following task:

“Please think about something you ideally would like (think you ought) to do. In other words, please think about a hope or an aspiration (duty or an obligation) you currently have. Please list the hope or aspiration (duty or obligation) in the following space.”

Followed by:

“Please list five strategies you could use to make sure everything goes right (avoid anything that could go wrong) and helps you realize your hope or aspiration (stop you from realizing your duty or obligation).”

Individuals in the control groups were given the following task:

“Please describe briefly the town, state, or area where you live (no addresses please). Please write this in the space below.”

Followed by:

“Please list five facts about this place.”

After subjects completed the priming task, they were asked to state how much they would expect to pay for a webcam. Depending on the subject’s randomly-assigned condition, the webcam brand was either high-quality (“Microsoft”) or fictitious³ (“Fabricam”), and had either standard features or standard features plus an innovative feature. Specific wording was as follows:

“Imagine that you are browsing in an electronics store. The last time that you were in the store, you noted that webcams with 2 megapixel resolution ranged in price from \$29 to \$69. The store sells webcams from a few different manufacturers, including Microsoft, who has a reputation for making high quality webcams (Fabricam, which recently started making webcams).

How much would you expect to pay for the following product?

- a Microsoft Lifecam (Fabricam) webcam with a 2 megapixel resolution (a 2 megapixel resolution and an innovative new feature: enhanced video mail capabilities) \$ _____”

Note that subjects were informed of the range of prices typically for the unenhanced product. These prices were consistent with the prevailing market

³ The Fabricam brand name is trademarked by Microsoft and used by Microsoft in studies that require a generic brand. It is used with permission in this study.

prices for 2 megapixel webcams at the time of the study, and were provided so that all subjects would have a common reference price range for the unenhanced product. Since the increase in price attributable to the enhancement or brand is of interest and not the price per se, this should have no influence on the results. Also note that while webcams featuring video mail capabilities were not generally available at the time of the study, subjects who said that they were familiar with the feature were excluded from the study.

Results and Discussion

A separate pretest of 324 individuals confirmed that, in the domain of computer hardware and peripherals, the Microsoft brand was preferred to the Frabricam brand. This was tested using the affect and trust scales developed by Chaudhuri and Holbrook (2001). On a seven-point scale, respondents gave a mean affect rating of 5.02 to the Microsoft brand, which was significantly higher than the 3.80 mean affect rating for the Frabricam brand ($p < .01$). Respondents also rated the Microsoft brand significantly higher than the Frabricam brand on the dimension of trust, with mean scores of 5.29 and 3.85, respectively ($p < .01$).

Overall, Study 1 provides strong support for Hypotheses 1a and 1b. Promotion-activated respondents expected to pay an average of \$4.96 more than the Control group ($F = 4.225, p < .05$), and \$5.95 more than the Prevention-activated group ($F = 5.067, p < .05$).

Reference prices for webcams with new features average nearly \$10 more for promotion-activated respondents than for prevention-activated respondents (\$54.06 as compared to \$44.20, $F = 4.47$, $p < .05$).

Although the average change in price attributable to the new feature among promotion-activated respondents is nearly \$7.00 greater for low quality products than for high quality products (\$10.44 vs. \$3.79), this difference is non-significant ($F = .674$).

Prevention-activated respondents price the high brand-quality product on average \$12.16 higher than they price the low brand-quality product, which is significantly greater than the price difference of \$4.14 observed in control group respondents ($F = 4.11$, $p < .05$). This supports the expectation that a prevention orientation creates greater sensitivity to quality signals.

The increase in expected price attributable to the new feature in the low-quality product was \$4.58 for prevention-oriented respondents, less than the \$12.11 increase observed in the control group ($F = 2.80$, $p < .055$). Also, difference in the price increase between the low and high quality products attributable to the new feature for prevention-elicited respondents is small and non-significant (\$4.58 in the low-quality product, vs. \$2.75 in the high-quality product).

Prevention-orientations, Brand, and Choice

Study 1 demonstrated the strength of brand as a quality assurance mechanism. However, research has shown that brand contributes to product value in other ways as well. It provides value through more hedonic characteristics such as “fun”, “exciting”, or “thrilling” (Voss et al. 2003). In contrast to brand quality, these aspects of brand value will contribute more to the evaluation of a product for promotion-oriented individuals than for prevention-oriented individuals (Chernev 2004).

Chaudhuri and Holbrook (2001) characterize these dimensions of brand quality as *brand affect* and *brand trust*. They define brand affect as “a brand’s potential to elicit a positive emotional response in the average consumer as a result of its use”, and brand trust as “the willingness of the average consumer to rely on the ability of the brand to perform its stated function”. They show that these dimensions each have a distinct impact on purchase loyalty and relative price.

It is therefore to be expected that a brand that is relatively strong in the dimension of affect will have value to individuals with a promotion-orientation. Brands that perform well in both the dimensions of affect and trust will provide value to individuals with both types of goal-orientation, albeit for different reasons. This observation is consistent with the findings in Study 1 in that both promotion- and prevention-oriented consumers expressed greater price expectations for high-quality products than for low-quality products, and the Microsoft brand outperformed the Fabricam brand in both affect and trust.

Price, on the other hand, can be generally considered a utilitarian product characteristic. It is also a negative characteristic in that any nonzero price incurs a loss on the consumer. Markman and Brendl (2000) make the case that reference characteristics for promotion goals are always positive, and that reference characteristics for prevention goals are always negative. Price may therefore be expected to strongly influence choice among prevention-oriented individuals and only weakly influence promotion-oriented individuals. A prevention-oriented individual would be expected to pay more for an increase in brand trust, but would be less sensitive to the gain in trust than a promotion oriented individual would be to a gain in brand affect. Further, the prevention-oriented individual would be more sensitive than the promotion-oriented individual to the loss of money corresponding to a higher price.

The dual effects of brand may be observed in Figure 23.

H2a. As compared to non-promotion-oriented individuals, promotion-oriented individuals will be more likely to choose more expensive products with high value brands over less expensive products with low value brands.

H2b. As compared to non-prevention-oriented individuals, prevention-oriented individuals will be more price sensitive, and will therefore be more likely to choose less expensive products with low value brands over more expensive products with high value brands.

Study 2:

Study 1 showed that regulatory focus systematically influences price expectations related to new features and varying levels of quality. Study 2 investigates how regulatory focus influences product choice with varying levels of price and features. In this study, participants are asked to choose between two products, one of which has a relatively high-value brand and the other of which has a relatively low-value brand. The relatively high-value brand is priced higher than the relatively low-value brand, forcing respondents to make a tradeoff between price and brand equity. In half of the conditions, the high-value brand is priced 60% higher than the low-value brand, making the price difference relatively large. In the other half, the price difference is a relatively small 12%.

Individuals with a prevention orientation have been shown to be more sensitive to brand-quality signals than other respondents in Study 1. They have also been observed to provide lower price expectations than individuals with a promotion orientation, suggesting that they are relatively more sensitive to price. Although Figure 6 provides no direct implications regarding how regulatory focus will influence a tradeoff between price and quality, I propose that where the price difference between a relatively high-quality brand and a relatively low-quality brand is large, a prevention-oriented individual be more likely to prefer the less-costly, lower-quality option than other individuals. This is because saving money is inherently utilitarian and riskless, and prevention-oriented individuals are sensitive to risk.

Study 2, investigates how this tradeoff between brand and price is moderated by regulatory-focus. Participants were assigned to one of twenty-four conditions based on a 4 (high-quality product improved, low-quality product improved, both products improved, or neither product improved) \times 3 (promotion-activated, prevention-activated, or control) \times 2 (relatively large price difference, relatively small price difference) factorial design.

Method:

534 participants between the ages of 25 and 64 participated in this study. 46% were male. After completing either one of the regulatory-focus activation tasks or the control task (as in Study 1), each respondent was asked to complete the following task:

Imagine that you are looking at desktop computers in the same electronics store. This store has a special relationship with manufacturers that allows them to sell mail-order brands.

If you were to choose between the following two systems, which would you be more likely to buy?

- A Dell XPS system with an Intel Dual Core processor, 2 GB RAM, 160 GB Hard Drive, and a CD burner (a CD burner, and an innovative internet optimizer that is advertised to provide a big improvement in web surfing speed) for \$800 (\$475)

- An eMachines system with an Intel Dual Core processor, 2 GB RAM, 160 GB Hard Drive, and a CD burner (a CD burner, and an innovative internet optimizer that is advertised to provide a big improvement in web surfing speed) for \$500 (\$425)

Then, respondents were asked to complete the Higgins Regulatory Focus Questionnaire (Higgins et al. 2001) in order to measure their chronic regulatory focus.

Results

Using the same pretest method described in Study 1, the Dell brand scored significantly higher than the eMachines brand in both the dimension of affect (4.85 vs. 4.03, $p < .01$) and trust (5.09 vs. 4.14, $p < .01$).

Individual RFQ Promotion and Prevention scores were calculated based on Higgins' scoring method, and the Prevention score was subtracted from the Promotion score to calculate the difference in orientation. Subjects were characterized as highly promotion oriented if the difference in orientation was in the top third of all respondents, or were characterized as highly prevention oriented if the difference in orientation was in the bottom third of all respondents. No relationship was detected between promotion (prevention) activation and chronic orientation.

Responses to the choice task were analyzed using a logistic regression. The dependent variable was coded as "1" where respondent chose the Dell computer and "0" where respondents chose the eMachines computer. Results,

summarized in Table 12, suggest a general preference for the less expensive eMachines computer and a significant change in preference due to the innovative feature.

These results also support Hypothesis 2a. Promotion-activated individuals are more willing than other individuals to pay more for a product with a stronger brand ($p < .10$). This suggests that promotion-oriented individuals are more likely to elaborate on the value of the brand, and that this elaboration is generally hedonic in nature. Chronically promotion-oriented individuals were also significantly more responsive to the addition of the new feature in the eMachines computer than were non-promotion-oriented respondents ($p < .05$). This finding provides additional support for Hypothesis 1a.

It should be noted that the significant relationship was found between the *chronic* promotion orientation and the new feature. No relationship between the *activated* promotion orientation and feature improvement was detected.

Activating a prevention orientation in the respondents significantly reduced the likelihood of the more expensive Dell computer being chosen where the difference in price is large ($p < .05$). This supports Hypothesis 2b - that, when prevention-oriented individuals are forced to choose between lower price and brand quality, risk aversion will lead them to favor lower price to a greater degree than non-prevention-oriented individuals.

General Discussion

This chapter describes the relationship of self-regulatory focus on consumer evaluation of new features in existing products, and shows how aspects of brand value asymmetrically influence product evaluations by promotion- and prevention-oriented individuals. As hypothesized, promotion-oriented respondents were shown to expect to pay significantly more for new features relative to prevention-oriented individuals, and to be more influenced in preference by new features than other individuals.

In Study 1, prevention-oriented respondents were shown to pay significantly more for improvements to brand quality than control respondents, supporting my hypothesis. Further, prevention-oriented individuals were shown to be more sensitive to differences in price than other individuals, as shown in Study 2.

This extends the work of Herzenstein et al. (2007) by showing that the effect of self-regulatory focus is not limited to innovative products, but also influences consumer preference to innovative features in existing products. Herzenstein et al. demonstrate that risk salience is the primary factor that causes prevention-oriented individuals to be less likely than promotion-oriented individuals to purchase an innovative product. I show that prevention-oriented individuals are highly receptive to risk-reducing quality assurance signals. Where the quality-assurance mechanism was in place, price expectations reported by prevention oriented respondents were not significantly different from those of other respondents. Whereas Herzenstein et al. demonstrate that making

risk more salient to promotion-oriented individuals results in equivalent purchase likelihoods between the groups, this research demonstrates that making risk less salient to prevention-oriented individuals results in a similar equivalency. I thereby find further evidence supporting the process they identify by which regulatory focus influences adoption and upgrades.

This research also builds upon the work of Nowlis and Simonson (1996) by illustrating the influence of self-regulatory focus, either chronic or state, on consumer response to innovative features to existing products. When a product's target consumers are relatively promotion-oriented, new or comparatively weak brands will profit more than relatively strong brands from the introduction of new features. For this reason, new applications provided by the new features will be more prominent to promotion-oriented consumers, and engagement in eagerness choice strategies will dictate that they assess the change. Brand trust, on the other hand, will be less prominent to these individuals since this attribute provides less direct potential benefits. A strong brand will indirectly enhance the value of all features in a product, not just the new feature, so adding the new feature to a product with a high quality brand will result in diminished sensitivity to the new feature relative to the case where the feature is added to the low quality brand (Nowlis and Simonson 1996). Importantly, no diminishing sensitivity effect is detected among prevention oriented consumers. The change in price expectations attributable to an improvement in quality is nearly the same regardless of whether the new feature is included in the product. This suggests that the influence of quality assurance on the perceived value of the new feature

for prevention-oriented individuals is either greater than directly observed in Study 1, or multi-attribute diminishing sensitivity somehow does not apply to prevention-oriented individuals. In that diminishing sensitivity is observed in the results provided by both the promotion group and the control group in Study 1, the latter explanation would appear unlikely.

These findings also have important implications in the context of diffusion of innovation. Models of diffusion of innovation such as the well-known Bass model segregate adopters into two categories: “influentials” and “imitators” (c.f., Van den Bulte and Joshi 2007), and strategies such as those outlined in Moore’s *Crossing the Chasm* (2002) are predicated on visionaries and early-adopters influencing later adopters. In general, I expect that influentials will tend to have a high promotion-orientation and imitators will tend to have a high prevention-orientation. Strategies likely to attract promotion-oriented individuals should have greatest effect early in the product lifecycle, and strategies likely to attract prevention-oriented individuals should have greatest effect later in the product lifecycle. Price reductions rather than the addition of new features may be less costly and more effective for mature products.

Firms with strong brand equity have a clear advantage when updating products. The brand strength will increase the value of the innovation for prevention-oriented consumers, allowing the firm to attract a large share of the market (both promotion- and prevention-oriented consumers) with the new feature while maintaining relatively high price points. In general, product

upgrades by strong brands will be most effective where the product is well-established in the marketplace and prevention oriented consumers are willing to consider purchase.

Firms without strong brand equity must be more careful about when to introduce product upgrades. Since prevention-oriented consumers will discount the value of their new features, the receptive market for their innovations will be much smaller. The best window for innovation will be early in the product lifecycle.

One interesting area of future research would be to determine whether it is possible to estimate the position of a product in its lifecycle based on the self-regulatory orientation of its current consumers. For example, if a large subset of recent purchasers tend to score high in promotion orientation, then it may be possible to say that the product is early in its lifecycle. Such a finding would improve long-term planning capabilities for firms.

In one well-known example, Apple entered the mp3-player product category with the iPod in late 2001. Although many other players were already available, Apple was able to overcome the incumbent firms in part through the addition of two innovative features: the simplified user interface and the iTunes music storage and purchasing system. This was a case of a new (in this category) brand attracting promotion-oriented individuals through the introduction of innovative features.

Apple has maintained dominance as the category matured by continuing to introduce new features such as the touch screen and improved video capabilities. While new entrants have attempted to establish themselves by introducing their own players with other new features, as of this writing the iPod brand continues to outsell the rest of the category combined. Prevention-oriented consumers, who provide growth for the established category, are more attracted to the new features in the existing high quality brand than to new features in new brands.

From a managerial perspective, this research provides insight into whether a firm hoping to attract new customers should emphasize lowering its prices or adding innovative features. Firms with relatively high equity brands may wish to add new features and maintain higher price points, even late into the product lifecycle, assuming that the price difference between brands is not too great. If the price difference between the high equity brand and other brands becomes very large late in the product lifecycle, then the firm may choose to lower the product price while retaining feature parity. Firms with relatively weak brands can hope to gain market share early in the product lifecycle through a combination of new features and lower prices, although when the difference in price is small, the higher quality brand will still enjoy a competitive advantage.

Promotion orientation has been aligned with an independent self-view, and prevention orientation has been aligned with an interdependent self-view (Lee et al. 2000). Independent self-views are common in the United States,

whereas interdependent self-views are common in other parts of the world such as Latin America and Asia. Should members of independent cultures largely exhibit patterns of preference consistent with those of a promotion orientation, and should members of interdependent cultures exhibit patterns of preference consistent with those of a prevention orientation, then firms may wish to update their regional strategies based on these findings as well. Innovative products should tend to sell better in independent or individualistic countries, making them good launching points for new products. Consumers in interdependent countries will be more likely to accept products that have been tested in other regions of the world.

In that the manner in which decisions were made in these studies did not vary substantially, this research does not address the question of how regulatory fit between choice strategy and goal orientation influences feature evaluation (Avnet and Higgins 2006). Decision makers have been shown to value decisions more highly when they are made in a way that is consistent with their self-regulatory focus. Similarly, the degree of fit between the characteristics of a task (e.g., novelty) and self-regulatory focus has been shown to influence enjoyment from completing the task (Freitas and Higgins 2002). Such effect can have a substantial impact on preference and willingness-to-pay (Avnet and Higgins 2003).

These findings have important implications for firms hoping to attract first time buyers of a product. Sales of mature products come not only from new

purchasers but from owners who choose to upgrade, however. The addition of an innovative feature (aka, a non-alignable enhancement) to a mature product will result in a greater tendency to upgrade as well (Okada 2006). No research has yet investigated regulatory patterns among groups of upgrading consumers, so it is unclear how the strategies outlined here would influence upgrading behavior.

FIGURES: CHAPTER 3

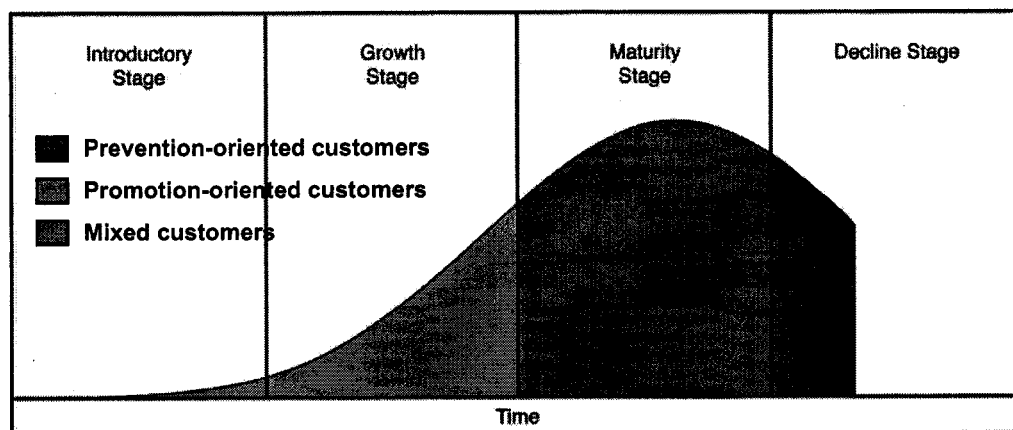


Figure 16: Product adoption over the product lifecycle by goal orientation of consumers

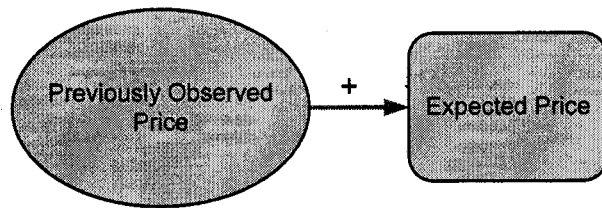


Figure 17: Predicted Expected Price (A)

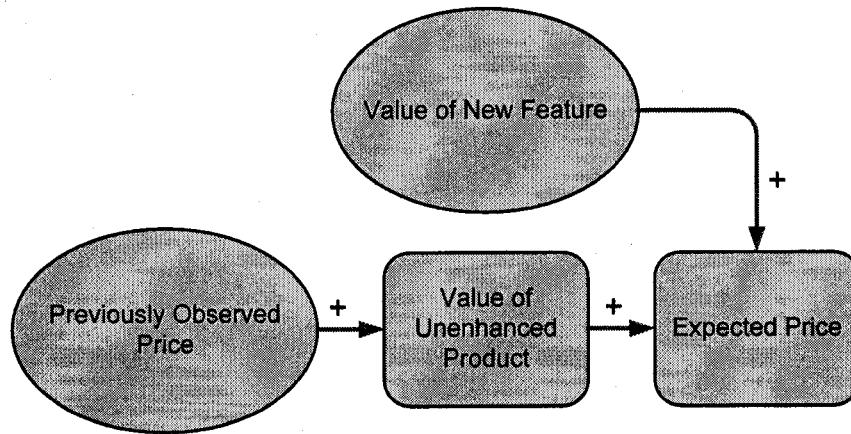


Figure 18: Predicted Expected Price (B)

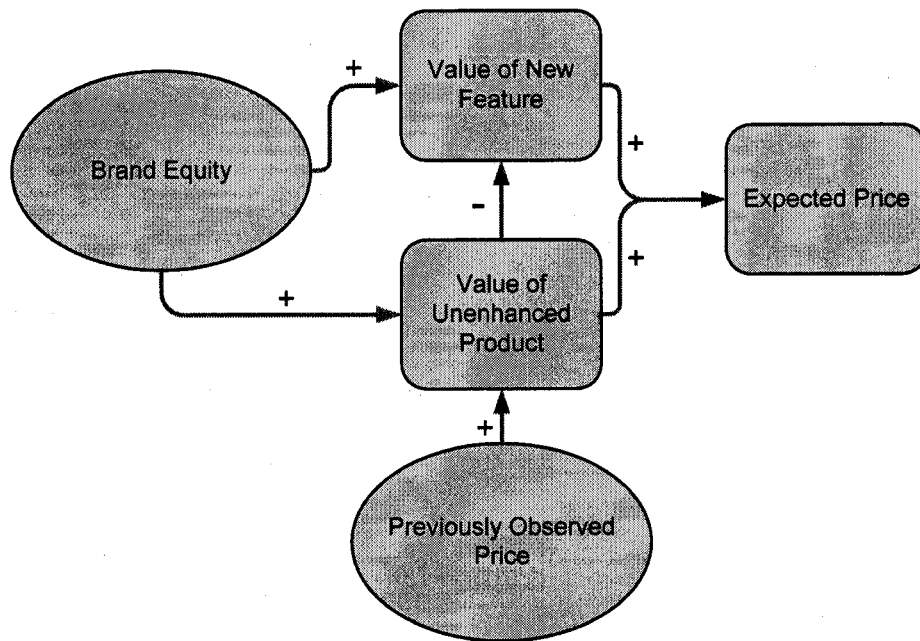


Figure 19: Predicted Expected Price (C)

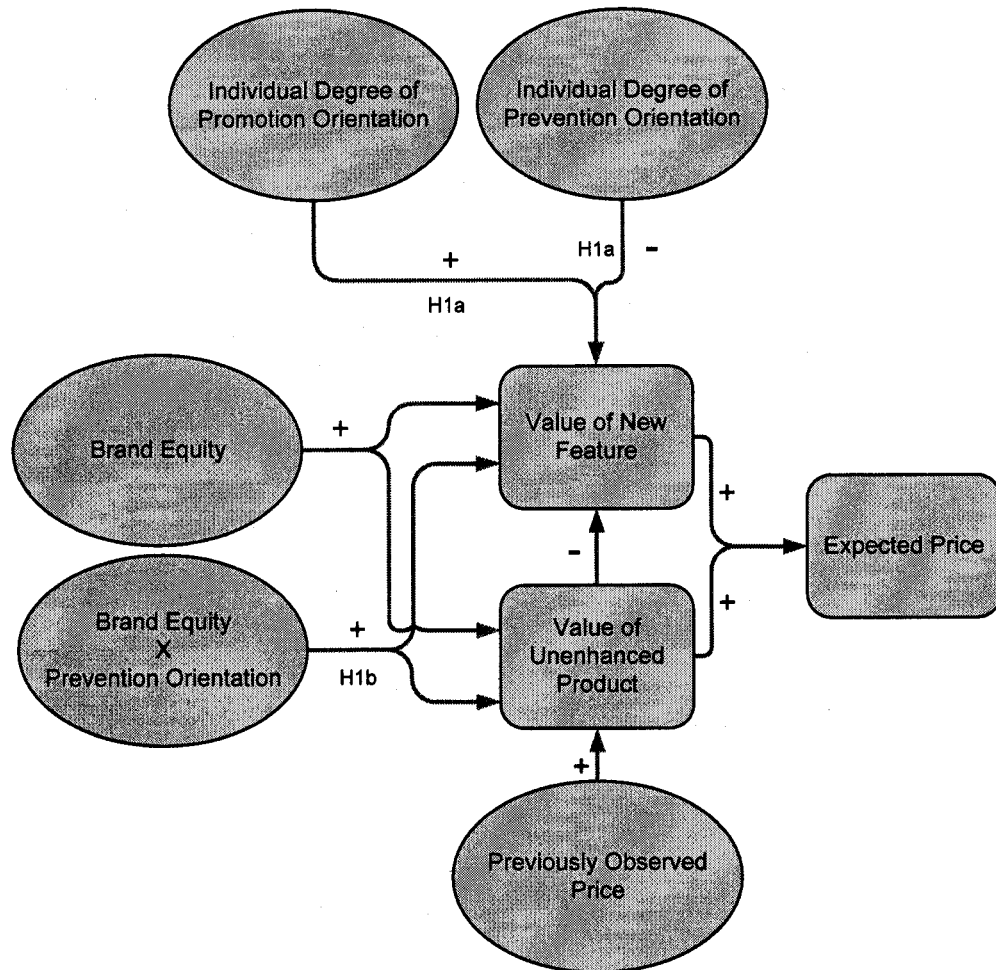


Figure 20: Goal-Orientation and Expected Price (A)

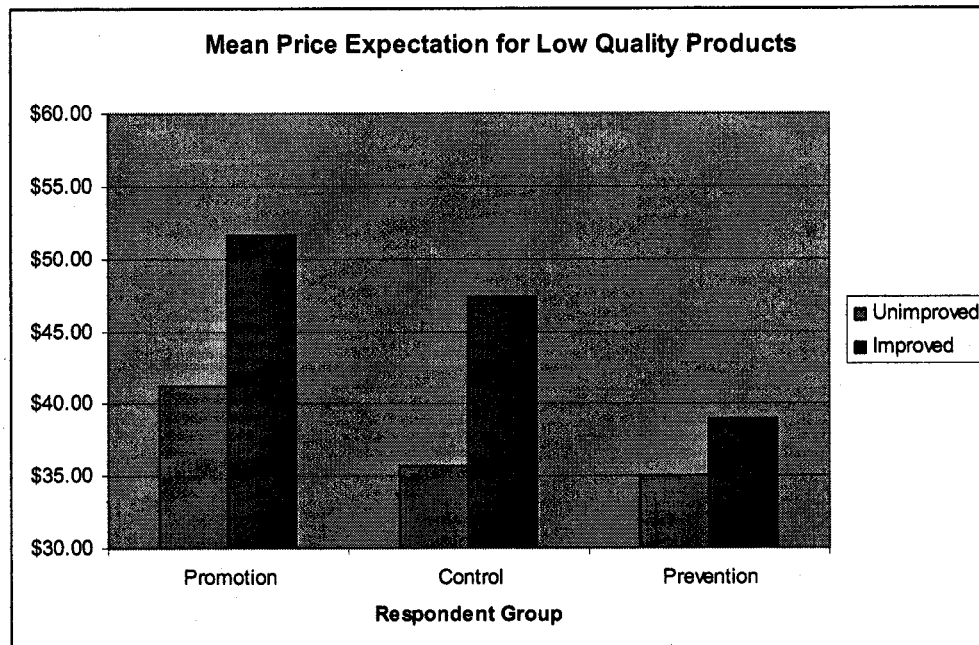


Figure 21: Average Price Expectations for Webcams Unimproved and Improved with a New Feature Added by Activated Goal-Orientation, Low Quality Condition

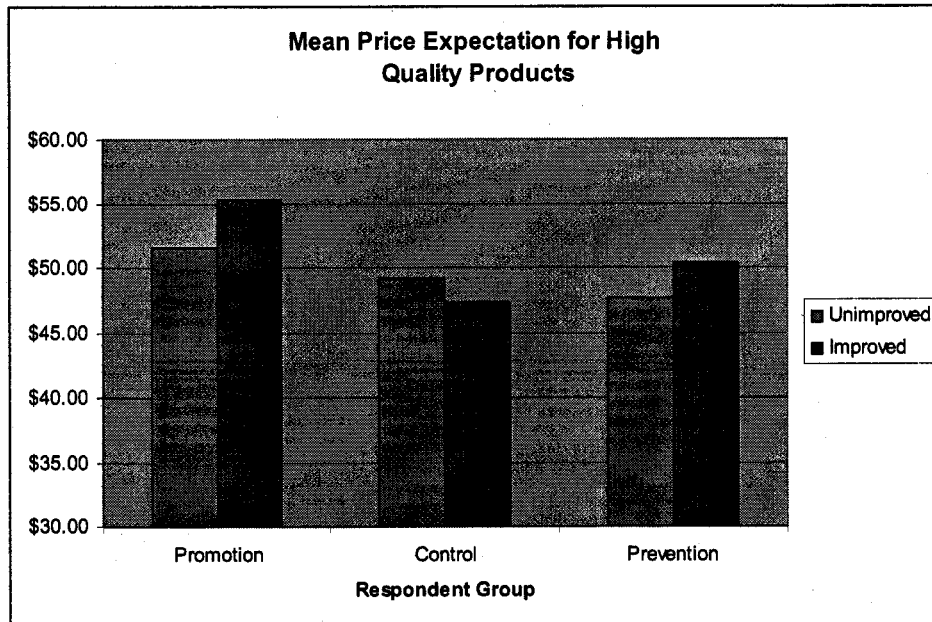


Figure 22: Average Price Expectations for Webcams Unimproved and Improved with a New Feature Added by Activated Goal-Orientation, High Quality Condition

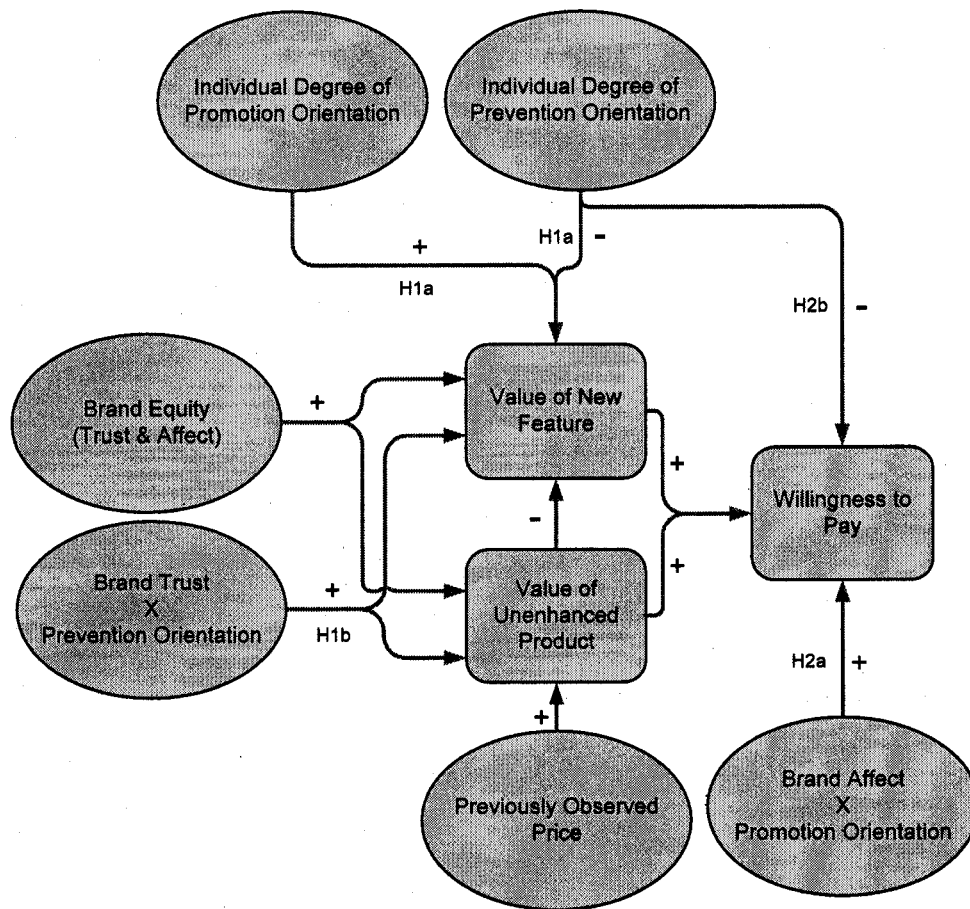


Figure 23: Goal-Orientation and Expected Price (B)

TABLES: CHAPTER 3

Table 10: Average Price Expectations for Webcams Unimproved and Improved with a New Feature Added by Activated Goal-Orientation, Low Quality Condition

Low Quality			
	Promotion	Control	Prevention
Unimproved	41.20	35.72	35.00
Improved	51.64	47.30	39.00

Table 11: Average Price Expectations for Webcams Unimproved and Improved with a New Feature Added by Activated Goal-Orientation, High Quality Condition

High Quality			
	Promotion	Control	Prevention
Unimproved	51.54	49.18	47.63
Improved	55.33	47.26	50.37

Table 12: Logistic Regression Results for Study 2 (Dependent Variable: Choice of Dell Computer = 1, Choice of eMachines Computer = 0)

Variable	Coef.			
	Estimate	Std. Error	z value	Pr(> z)
Intercept	0.35	0.32	1.10	0.27
Dell Improved	1.27 **	0.35	3.66	0.00
eMachines Improved	-0.60 *	0.34	-1.78	0.08
Large Price Difference	-0.52	0.36	-1.45	0.15
High Chronic Promotion-Orientaion	0.75	0.48	1.58	0.11
High Chronic Prevention-Orientaion	0.13	0.42	0.31	0.75
Activated Promotion-Orientaion	0.51 *	0.30	1.72	0.08
Activated Prevention-Orientaion	0.43	0.29	1.50	0.13
Large Price Difference × Activated Promotion-Orientaion	-0.77	0.56	-1.38	0.17
Large Price Difference × Activated Prevention-Orientaion	-1.85 **	0.62	-2.98	0.00
Dell Improved × High Chronic Promotion-Orientaion	-0.43	0.52	-0.83	0.41
eMachines Improved × High Chronic Promotion-Orientaion	-1.27 **	0.52	-2.42	0.02
Dell Improved × High Chronic Prevention-Orientaion	-0.54	0.51	-1.07	0.29
eMachines Improved × High Chronic Prevention-Orientaion	-0.15	0.50	-0.30	0.76

Note: * indicates significance at $p < .1$, ** indicates significance at $p < .05$

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