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# When Do Higher Prices Increase Demand?

## The Dual Role of Price in Consumers' Value Judgments

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## Abstract

Drawing on literature on judgment and decision-making, we examine the proposition that price serves two distinct roles in consumers' value judgments. First, as a product attribute, price affects the perceived similarity of the target product to the mental prototype of a higher or lower quality product. However, price is not the only attribute used to make similarity based quality judgments. Other relevant and available product attributes moderate the effect of price on quality judgments. Second, as a measure of sacrifice, price serves as the benchmark for comparing utility gains from superior product quality. However, this comparison process is dynamic because the relative importance of money and product quality changes across consumption occasions. We present a signal detection model of consumer's price-value judgment to explain how high prices simultaneously increase as well as decrease purchase intentions. We describe how managers can use this model of value judgment to identify situations when higher price may increase demand.

## 1. Introduction

Minivac 601 was a $79 educational aid for helping to learn how binary arithmetic and computer assembler languages worked. Although it gained fast acceptance amongst educational institutions and home hobbyists, large corporations were unwilling to buy it as a device to help their employees learn more about how computers worked. The firm selling the product repainted the device from red and blue to gunmetal-grey, changed the tolerance on some of the switches (at a very nominal cost) and renamed the device the Minivac 6010. They also increased its price to $479. All of these changes made the device acceptable to corporations as a legitimate learning device and not as just a toy. Hundreds of Minivac 6010's sold to businesses at $479.

The marketing literature cites several similar anecdotal product-pricing stories (c.f., Gabor 1988, Monroe 2003, Nagle and Holden 1987) to suggest that sometimes, higher prices can increase demand. Gin was not considered a preferred drink until successive increases of the excise duty brought the its price closer to Whiskey. Similarly, in the 1950s when Pepsi stopped its lower price campaign (‘twice as much for a nickel’) and started its lifestyle campaign, its market share increased. The sales of a car wax reportedly increased when its price was raised from 69 cents to $1.69. Such effects have been interpreted as evidence for the proposition that consumers perceive high price to be associated with superior quality. Apparently, many consumers who would have never tried gin or Pepsi or the new car wax, started trying these products when these products were associated with higher prices. Such positive price-quality relationships are embodied in the popular folk wisdom - you get what you pay for.

When does higher price lead to greater demand? That price serves two distinct roles – one as a measure of sacrifice and the other as a signal of quality – has been known for a long time (Leavitt 1954). However, it is not clear when the "signaling effect" of price dominates the "sacrifice effect" (Jacoby and Olson 1985, Rao and Monroe 1989, Zeithaml 1988). This research analyzes *how* consumers make judgments of quality and value to predict when higher prices will lead to higher purchase intentions. The signal detection model of price-value judgment developed in this paper, and the two empirical studies presented in this paper, suggest that three broad factors interactively predict consumers' value judgments for new products with uncertain quality: (i) the odds of high quality based on a categorization process (ii) the relative importance of product quality and price evaluation and (iii) the actual distribution of prices in the market. Since the third factor is exogenous and is largely outside the managers' domain of influence, our exposition focuses more on the effects of the first two factors.

The rest of the paper is organized as follows. In the next section we review the extant literature on price-demand relationships. We next develop a signal detection model of consumers' price-value perceptions, which draws from previous research in judgment and decision-making, and derive several hypotheses from this model. We test these hypotheses in two studies. The first study uses secondary data (Zagat restaurant ratings) to perform a descriptive analysis of consumers' perceptions of local restaurants. The second study experimentally tests the relationships between price, perceived quality, and intentions. We then conclude by presenting a decision-making guideline derived from the signal detection model that managers can use to assess whether they can increase revenues by increasing price, discussing our theoretical contributions, and outlining opportunities for continued research in this area.

1.1 Literature on the Positive Correlation Between Price, Perceived Quality and Demand

Over the past several decades, researchers have adopted several different perspectives to explain the positive relationship between price and demand. Some of the research has examined the positive relationship between price and quality from a manufacturer's perspective (Akerlof 1970, Klein and Leffler 1981, Pashigian 1995). Such models essentially examine the optimal strategy for firms when there is information asymmetry about the quality of a product whose quality is revealed to consumers only after purchase. When consumers are uncertain of product quality, then profit-maximizing manufacturers have to decide whether or not to charge a price premium as a signal of high quality. This approach suggests that manufacturers will choose the pricing strategy that maximizes their long-term profits. In such models, description of consumer behavior is restricted to examining how consumers conduct their price search and do utility maximization under conditions of asymmetric quality information and some form of price discrimination (Phlips 1983).

Other researchers have examined this phenomenon from a consumer perspective. Some inquiries in this stream focused on the relationship between objective product quality and price (Gerstner 1985, Hjorth-Anderson 1984, Scitovszky 1945, Sproles 1977). However, with the proliferation of the perspective that purchase decisions are not based on objective facts but on subjective beliefs, the emphasis shifted from objective product quality to quality as perceived by consumers (Leavitt 1954, Jacoby and Olson 1985, Nagle and Holden 1987, Monroe 2003). However, an unequivocal positive relationship between price and perceived quality is yet to emerge. While in some studies higher price was associated with high perceived-quality, in other studies no such relationship manifested (Bonner and Nelson 1985, Parasumaran, Zeithaml and Berry 1985). Based on a review of nearly 90 studies done in the past 30 years, Zeithaml (1988, p.11) concluded that a “general price-perceived quality relationship does not exist.”

In the light of such equivocal findings, the recent literature on pricing has emphasized the need to study *how* consumers make judgments of price, quality and value (Dodds, Monroe and Grewal 1991, Monroe and Krishnan 1985, Monroe and Dodds 1988, Zeithaml 1988). “Still needed is research on how quality perceptions are formed and how these quality perceptions influence perceptions of value….” (Rao and Monroe 1989, p.356). This research adopts such a perspective.

## 1.2 A Judgment and Decision Making Approach

The signal detection model of price-value judgment developed in this paper incorporates findings from the judgment and decision-making literature into the conventional utility maximization framework. Drawing on the theory of signal detectability (Coombs, Dawes and Tversky 1970, Green and Swets 1966) and Tversky’s (1977) theory of similarity judgments, the signal detection model describes how consumers judge the signal embedded in a price as well as the process by which consumers compare quality and the price of quality. Further, it specifies conditions when the “signaling effect” or the “sacrifice effect” of price will dominate in purchase decisions. The model also explains why the effect of price on perceived value is moderated by factors such as brand name or store name and thus integrates many of the findings reported in past research. Although we use a utility maximization framework to identify factors that affect price-quality judgments, our description of the judgment process is not based on the logic of calculus. Instead, we describe the judgment process in terms of the heuristics used by decision makers. In doing so, we share Gigerenzer and Todd's (1999) perspective that rationality can be found in the use of smart and simple inference mechanisms (i.e., heuristics) used in day-to-day decision-making.

The roots of signal detection theory (SDT) are based in statistical decision theory and electrical engineering. Subsequently, psychologists discovered that SDT could also be used to model perceptual processes (Harvey 2003) and judgment processes (Coombs, Dawes and Tversky 1970) that involve "signal" and "noise" in incoming information. Decision makers often encounter uncertain information. For instance, a physician often makes diagnostic judgments based on symptoms that indicate a disease with some uncertainty (e.g., high blood pressure that could indicate either stress or a more severe chronic ailment). Similarly, a recruiter screens and selects candidates based on test scores that imperfectly indicate talent. In the SDT lexicon, decision makers in such situations face a signal detection problem. When the high blood pressure is on account of a chronic ailment or when the high test-score is associated with good talent, then the observed information is said to be a signal. On the contrary, when the high blood pressure is merely due to stress or when the high test score camouflages poor talent, then the observed information is said to be noise. The decision maker's judgment task then is to derive an optimal decision strategy to detect the signal against a background of noise.

In this paper, we suggest that consumers face such a judgment task when they encounter high priced products. A high price could either be associated with high perceived-quality (i.e., a signal) or it could be associated with mediocre[1] perceived quality (i.e., a misleading signal, which we label noise in order to be consistent with the SDT literature). The consumer has to judge whether the encountered price information is a true signal of high quality or whether is a misleading signal, in other words noise. Ideally, the consumer would want to buy high priced products only when the given price information is a true signal of high quality because a high price not only signals high quality, but it also is associated with greater economic sacrifice. The SDT framework examines the decision criterion used by consumers based on the probability distributions of noisy price information, prior beliefs of quality based on product categorization, and the subjective importance of money and product quality in consumption utility, to build a simple, yet powerful model of consumers' decision making process.

## 2. The Signal Detection Model of Price-Value Judgment

Consistent with the extant literature, we define perceived quality as a relative evaluation of the product based on the subjective utility of consumption. If the consumer has wealth $w$ and spends $p$ units of money for a product $x$ with quality $Q$, then his utility can be represented as $U(x_Q,w\text{-}p)$. A consumer will perceive that product $x$ to be of high quality if $U(x_Q,w\text{-}p) > U(w)$. That is, a product is defined to be of high perceived-quality only if it increases consumers' total utility. The consumer will not perceive the product to be of high quality if $U(x_Q,w\text{-}p) \leq U(w)$. Note that we define quality in terms of consumers' subjective utility for the product and the subjective utility for the price of the product, and hence our focus is on *perceived quality* rather than the manufacturer's view of objective quality. This view of perceived quality is consistent with definitions used in the past literature; perceived quality has been defined "as the consumer's judgment about the superiority or excellence of a

[1] We use this term throughout this paper to refer to products that are *not* of high quality.

product" (Zeithaml 1988, p.5). Our approach to perceived value and utility is also consistent with that used in past literature (Zeithaml 1988, p.14): "perceived value is the consumer's overall assessment of utility of a product based on perceptions of what is received and what is given."

High prices that are associated with high quality are signals that the consumer wants to detect, and high prices associated with mediocre quality can be thought of as noise that the consumer wishes to avoid. When a consumer encounters a high priced product, s/he is aware that not all high priced products offer high quality. If the high price turns out to be a signal (i.e., high price with high quality) then s/he might benefit from buying the higher priced product. But if the high price turns out to be noise (i.e., high price with mediocre quality) then s/he might be wasting her money. The situation is depicted by the two price distributions in figure 1. The left distribution shows that the probability of the price $p$ being associated with low quality (i.e., noise), which is $\phi\ (p/x_{QL})$. The partially overlapping right distribution shows the probability of the price $p$ being associated with high quality (i.e., signal), which is $\phi\ (p/x_{QH})$ where $x_{QH}$ is a high quality product and $x_{QL}$ is a low quality product.

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Insert figure 1 about here
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Because the distributions overlap, three different utility states are possible. The consumer may *not* consider the product to be a good buy at the high price $p$. S/he would then decide not to buy the high priced product of uncertain quality, in which case s/he will retain her wealth and her utility will remain unchanged at $U(w)$. However, if s/he does consider the product a good buy at the high price $p$ and buys the product, then two outcomes are possible. If the purchased product actually turns out to be of superior quality then her net utility will increase to $U(x_{QH}, w\text{-}p)$ . On the contrary, it is also possible that the purchased product is of mediocre quality, in which case the consumer's net utility will decrease to (or remain unchanged at) $U(x_{QL},w\text{-}p)$. Usually SDT models also account for the effect of missing a signal (i.e. an opportunity loss) on the pay-off (e.g., Coombs, Dawes and Tversky 1970). However, since mere knowledge about product quality, without consumption of the product, does not affect consumer's utility, it is assumed that opportunity costs (i.e., the costs associated with not purchasing a high quality product because the high price was deemed to be noise) will not affect subjective utility. Given the price $p$, the conditional probability that the price is from the signal is denoted as $\phi\ (x_{QH}/p)$ and that the price is from noise is denoted as $\phi\ (x_{QL}/p)$. The payoff matrix for the decision task is given in table 1.

**Table 1. Consumers' Pay-Off Matrix**

| | | Price-Value Decision Rule | |
|---|---|---|---|
| | | Buy at Price $p$ | Do Not Buy at Price $p$ |
| Perceived Quality | High Quality (Signal) | $U(x_{QH},w\text{-}p)$<br>*Correct Detection* | $U(w)$<br>*False Rejection* |
| | Mediocre Quality (Noise) | $U(x_{QL},w\text{-}p)$<br>*False Detection* | $U(w)$<br>*Correct Rejection* |

2.1 Factors Affecting the Price-Quality Decision Rule

As depicted in the payoff matrix, the consumer has to judge the quality of the product and make the contingent buy versus no-buy decision. When should the consumer consider buying a high priced product? A utility maximizing consumer would tend to use the decision rules so as to maximize expected utility. So an expected utility maximizing consumer would consider buying the higher priced product only if:

E(*Buy* | *p*) ≥ E (*No Buy* | *p*) ----- (1)

Where, *Buy* | *p* ≡ Consider buying the product with uncertain quality at price p

and *No Buy* | *p* ≡ Do not buy the product with uncertain quality at price p

$$E(Buy \mid P) = U(x_{QH}, w-p)\,\phi(x_{QH}/p) + U(x_{QL}, w-p)\,\phi(x_{QL}/p)$$

$$E(No\ Buy \mid P) = U(w)\,\phi(x_{QH}/p) + U(w)\,\phi(x_{QL}/p)$$

Rearranging the terms in (1), we get

$$\frac{\phi(x_{QH}/p)}{\phi(x_{QL}/p)} \geq \frac{U(w) - U(x_{QL}, w-p)}{U(x_{QH}, w-p) - U(w)}$$

The conditional probabilities can be rewritten by applying Bayes' rule.

$$\frac{\phi(p/x_{QH})}{\phi(p/x_{QL})} \geq \left[\frac{\phi(x_{QL})}{\phi(x_{QH})}\right]\left[\frac{U(w) - U(x_{QL}, w-p)}{U(x_{QH}, w-p) - U(w)}\right] \text{ ----- (2)}$$

Equation (2) suggests that under conditions of quality uncertainty, consumers' value judgments depend on three factors: (i) the first ratio on the right hand side reflects judgments about the odds of high quality (ii) the second ratio on the right hand side reflects the relative importance of product quality and price evaluation and (iii) the left hand side ratio reflects the actual distribution of prices in the market.

The first factor captures the effect of probabilistic inferences about quality based on consumers' beliefs and knowledge. The higher the proportion of high quality products in the category, the greater the chances of purchase. The second factor captures the relative effects of judgmental errors on net utility. The numerator of the quotient reflects the utility loss incurred with false detection while the denominator reflects the utility loss incurred with false rejection. As we shall elaborate later, the relative effects of false rejection and false detection vary across purchase occasions. The third factor, which is the likelihood ratio on the left-hand side of the equation, captures the effect of the actual distribution of prices of high and mediocre quality products in the category. This likelihood ratio is a mathematical representation of consumers' tendencies to use the heuristic "the higher the price, the better the product" and it reflects the consumers' assessments of the likelihood that the observed price is drawn from the subset of high quality products rather than from the subset of mediocre quality products in that category[2]. If the distribution of prices of high quality products is to the right of that of mediocre quality products (as depicted in figure 1), then higher prices will be associated with greater likelihood of high quality. Further, the separation between the price distributions of the two levels of quality, represented by the distance *d* between the means of the two distributions (see figure 1), affects this ratio. If the distribution of prices of high quality products is congruent with that of mediocre quality products, such that d=0, then the likelihood ratio remains unaffected by the price changes. In such cases the decision criterion will depend only on factors (i) and (ii). The greater the separation between the prices of mediocre and high quality products, the more likely is it that a high price will increase demand. This property can independently explain why positive price-quality correlation manifest in certain product markets and do not manifest in many other product markets[3].

However, since the distribution of prices in the market is an exogenous factor that managers cannot directly influence, from a managerial perspective this factor is of less

[2] While prior odds captures the effect of proportion of high quality products, the likelihood ratio takes into account the correlation between price and quality.

[3] Bonner and Nelson (1985) found that consumers do not use price as an indicator of quality for packaged foods. But consumers do seem to use price as an indicator of quality for restaurants. One of the reasons for this difference is that the separation between the price distributions of high and low quality products may be lower for packaged foods than that for restaurants. Stated differently, the value of *d* seems to be higher for restaurants than for packaged goods.

interest. Therefore, for this paper, we restrict our discussion to the two factors on the right hand side of (2). The decision criteria suggest that even at high prices, the likelihood ratio may not be higher than the magnitude of the right-hand side terms of the equation. The decision will depend on consumers' judgments of the odds of quality and the relative importance of quality and price in anticipated consumption utility. We discuss in detail each of these two factors in the subsequent sections.

## 2.2 The Effect of the Categorization Process on Quality Expectations

The first ratio on the right-hand side of equation two, (i.e., $\phi(x_{QL})/\phi(x_{QH})$) indicates that the decision will depend on expectations about quality. If the odds of high quality are unfavorable, then consumers will be less likely to buy the product. How do consumers form expectations about the quality of a product before consuming it? Research on judgment under uncertainty suggests that such probabilistic judgments are often based on the representativeness heuristic (Tversky and Kahneman 1974). A product will be judged to be of high quality if the product resembles the mental prototype of high quality products. Inductive inferences mediate the effect of categorization on probabilistic inferences (Smith, Lopez and Oshersm 1992, p.181): "An obvious way in which categories support inductive inferences is that if we know that an object belongs to a category, we can infer that the object has properties that characterize the product. For example, if we know that a particular creature is a bird, we may infer it flies and nests in trees."

This proposition stands on the assumption that consumers have well defined prototypes for high and low quality products. Previous research seems to support this assumption. Sujan (1985, p.32) found evidence to support the notion that consumers group similar products into coherent subcategories and for each subcategory they develop "a set of hypotheses about what attributes go together, what constitutes typical configurations of attributes, and what performance levels can be expected." Research in the domain of social cognition (Kunda and Oleson 1995, Macrae and Bodenhausen 2000) has found that people categorize a given stimulus into subtypes or subcategories that are more coherent. Moreau, Markman and Lehmann (2001) observed that consumers create representations for new products based on information already contained in familiar product categories. Herr (1989) found that by obtrusively presenting exemplars of cars, it is possible to activate category representations of cars that are similarly priced. Rao and Monroe (1988) observed that their prior knowledge affects the way in which consumers use information cues to evaluate products. In fact, multidimensional scaling, which is a popular market research tool, is based on the premise that consumers divide products into well-defined and coherent subcategories. Green, Tull and Albaum (1992) report an illustrative example of how consumers form coherent subcategories of products. Based on multidimensional scaling of dissimilarity judgments of 15 bread/pastry items, researchers found that consumers form subcategories of those bread/pastry items based on sweetness and toasted-plain dimensions. For instance, coffee cake, jelly donut, glazed donut and Danish pastry formed one coherent subcategory while toast with margarine, hard rolls with butter and buttered toast formed another subcategory. Corn muffin and English muffin formed a distinct third subcategory. These studies buttress our argument that new products evoke prototypes of subcategories.

So when faced with an unfamiliar product, consumers undergo a task of assigning that product to one of the several possible subcategories evoked by the product. It is important to understand how consumers arrive at a match between a particular subcategory and an unfamiliar product. Tversky's (1977) contrast model suggests that consumers will assess the match between a subcategory and a product based on the perceived similarity of attributes. "Objects, concepts and events are normally organized and categorized on the basis of their common and distinctive features" (Ritov, Gati and Tversky 1990, p.30; also see the discussion on categorization by the elimination heuristic, Gigerenzer and Todd 1999). The contrast model suggests that whether a given product will be perceived as a part of a subcategory will depend on the common and distinctive features of the product weighted for salience and importance. Formally, if a product $x$ is represented by a set of attributes, denoted by $X$, then the similarity of this product with the high quality subcategory $x_{QH}$ (with set of attributes denoted by $X_{QH}$) will be given by:

$$g(X \cap X_{QH}) - f(X_{QH} - X) - f(X - X_{QH})$$

where, $g(X \cap X_{QH})$ is the measure of attributes shared by $x_{QH}$ and $x$ and $f(X - X_{QH})$ is the measure of attributes of the product that are *not* shared by the subcategory and $f(X_{QH} - X)$ is the measure of attributes of the subcategory that are *not* shared by the product. It is apparent that the probability of the product $x$ being of high quality (i.e., $\phi(x_{QH})$) will also be a function of these factors.

$$\phi(x_{QH}) \propto g(X \cap X_{QH}) - f(X_{QH} - X) - f(X - X_{QH}) \qquad \text{-----} \qquad (3)$$

Thus this model suggests that more the number of common attributes and the fewer the number of distinctive attributes between a product and a subcategory, the greater the likelihood that the product will be perceived to be a part of that subcategory. An interesting implication of the contrast model is that *price, like any other product attribute, will affect product categorization*. If the price of a product is similar to that of high quality products, then consumers may have expectations of high quality from that product. However, price is not the only attribute that affects quality expectations. Other salient attributes also affect perceived similarity and the contingent quality expectations. Stated differently, all salient product attributes, including price, will interactively influence the quality expectations of an unfamiliar product.

Consider the following illustrative purchase situation. A consumer who wants to dine out is trying to decide whether she should dine at a recently opened restaurant that is relatively high priced. She has not been to this restaurant; but she is aware of the price of an average meal at this restaurant. The consumer's task is to make a buy/do-not-buy decision based on her judgments of food quality. Such a situation is representative of many evaluations that involve one or more new products that are relatively high priced. The SDT model of price-value judgment suggests that the consumer's decision will depend on his/her expectations about the probability of this restaurant being a high quality restaurant. This expectation, in turn, will depend on the subcategory that the consumer perceives this restaurant belongs to. Based on information about the décor of the restaurant, if the consumer categorizes the restaurant as a "formal restaurant" then the prior odds of superior quality will be high. On the contrary, if she categorizes the restaurant as a "casual restaurant" and believes that most casual restaurants are of relatively lower quality then her prior odds of high quality will be lower. In such a case, she would be less likely to go to that restaurant. The effect of attribute-based categorization on quality expectations is depicted in figure 2.

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Insert figure 2 about here

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Thus perceived similarity and the categorization process of the product play important roles in price-quality judgments and contingent purchase decisions. Formally,

**H1a**: A high price is more likely to enhance perceived quality when the product is perceived to be more similar to high quality products than to mediocre quality products.

**H1b**: A high price is more likely to increase demand when the product is perceived to be more similar to high quality products than to mediocre quality products.

## 2.3 Varying Subjective Utility for Quality

The second term on the right-hand side of Equation (2) suggests that consumers' response to high price will also depend on the relative effects of false detection and false rejection on subjective utility. Since this judgment entails a comparison of perceived quality with utility from the amount of money paid for getting that quality, it reflects the role of price as a measure of sacrifice (Monroe and Krishnan 1985, Zeithaml 1988). However, the subjective utility for quality and price is dynamic and changes across consumption occasions. When quality is uncertain, two types of judgmental errors are possible - false rejection or false detection (see table 1). In the case of false detection, the consumer will end up paying a high price for a mediocre quality product. In the case of false rejection, s/he will lose the opportunity to increase total utility through superior quality. In some situations it is safer to err on the side of choosing a higher priced product (i.e., false detection), while in other situations it is safer to err on the side of choosing lower priced products (i.e., false rejection). Once again, consider an illustrative example of the consumer who is deciding whether to dine at a recently opened, expensive restaurant. When this consumer is planning a formal dinner (with his/her superior at work or a date), going to a high quality restaurant will be more important than the associated price of quality. S/he will be quite willing to pay more in the hope of getting high quality, knowing well that actual quality is uncertain and that the restaurant may turn out to be of mediocre quality. Stated differently, the gain in utility from high quality (i.e., $U_i(x_{QH}, w\text{-}p) - U_i(w)$) will be perceived to be higher than the perceived utility loss on account of parting with that amount of money (i.e., $U_i(w) - U_i(w\text{-}p)$). Formally,

$$U_i(w) - U_i(w\text{-}p) \prec U_i(x_{QH}, w\text{-}p) - U_i(w)$$

Since $\qquad U_i(w\text{-}p) \prec U_i(x_{QL}, w\text{-}p)$

it follows that $\qquad U_i(w) - U_i(x_{QL}, w\text{-}p) \prec U_i(x_{QH}, w\text{-}p) - U_i(w) \qquad$ -- (4)

On the contrary, if the consumer is going out to get a quick lunch, then s/he will be less willing to spend money on a expensive restaurant with uncertain quality. In this case, s/he will deem it safer to err on the side of lower price. On such occasions, the loss in utility from paying a high price for mediocre quality (i.e., $U_j(w) - U_j(x_{QL},w\text{-}p)$) will be perceived to be higher than the gain from high quality (i.e., $U_j(x_{QH}, w\text{-}p) - U_j(w)$). (Subscripts *i* and *j* represent utility in quality-important and quality-unimportant consumption occasions respectively.) Formally,

$$U_j(x_{QH}, w\text{-}p) - U_j(w) \prec U_j(w) - U_j(x_{QL}, w\text{-}p) \qquad \text{-- (5)}$$

It follows from (4) and (5) that,

$$\left[\frac{U_i(w) - U_i(x_{QL}, w - p)}{U_i(x_{QH}, w - p) - U_i(w)}\right] \prec \left[\frac{U_j(w) - U_j(x_{QL}, w - p)}{U_j(x_{QH}, w - p) - U_j(w)}\right]$$

This inequality suggests that consumers are more likely to consider buying high priced products on consumption occasions when high quality is relatively more important than the price of quality. Formally,

**H2**: Consumers are more likely to buy high priced products when perceived quality is more important than price evaluation.

In the subsequent sections we present some empirical support for these two hypotheses. In study 1 we analyze survey data to examine whether the prior odds of high quality and price quality likelihood ratios vary across categories formed on the basis of similarity of attributes (price, décor and service ratings of restaurants). In study 2 we examine experimental data to seek evidence for the dual role of price as well as to test the effect of the consumption situation on the relative importance of quality. Finally, we present a decision tree managers can use to assess whether they can increase revenues by increasing price.

## 3. Study 1: The Effect Of Attribute Based Categorization On Perceived Quality

The purpose of this study is to test how attribute based categorization of products affects perceived product quality. Our theorization on quality judgment suggests that consumers form coherent subcategories of products based on attribute similarities and that these categories vary in their quality expectations. Thus, we hypothesize that clusters of products based on attribute ratings will differ in their mean quality ratings. Further, we also test the relationship between price and quality in different clusters to examine whether the price-quality decision heuristic used by consumers changes across these clusters.

### 3.1 The Dataset

In this study, we analyzed secondary survey data to test our assumption about the link between categorization and quality perceptions. Specifically, we analyzed restaurant data from the 2002 Zagat Survey for a large metropolitan market (Zagat 2002). Zagat is a popular restaurant guide used in many parts of the United States. For several reasons, this database provides a good opportunity to test price-quality hypotheses. First, since this survey covers hundreds of restaurants with large variations in quality, the database offers a wide range of quality ratings. Second, this is one of the few publicly available databases that record quality as perceived by consumers. Finally, this database contains not only price and perceived food quality ratings, but also customer ratings on other attributes like décor and service that may serve as categorization cues. Thus this database provides us with enough information to study consumers' mental representation of restaurant clusters in terms of price, food quality and other attributes. To the best of our knowledge, this is the first time that this large-scale survey of quality, as perceived by lay consumers (rather than quality as evaluated by experts), is being used in quality research.

The restaurant evaluations used in this study came from over 29,000 respondents. The survey assessed ratings on décor, service and food quality along with the cost of an average meal (including one drink and tip) for the listed restaurants. Ratings for décor, service and food quality ranged from zero (poor) to 30 (perfection). All ratings and prices were standardized before analysis. We analyzed data from 369 restaurants from the guide. Specifically, we included all restaurants whose name began with the letter A, B, C, X, Y or Z. We hypothesized that mental clusters of restaurants, formed on the bases of décor, service and cost, will predict perceptions of food quality. More specifically, the similarity-based categorization model suggests that restaurants that are categorized as "formal" restaurants (i.e., restaurants with relatively high scores on décor, service and cost) will be associated with higher mean food quality than those that are categorized as "casual" restaurants.

### 3.2 Categorization and Quality Ratings

We used cluster analysis (Punj and Stewart 1983) to group restaurants based on standardized décor, service ratings and log-price into homogeneous and diagnostic groups *without any prior assumptions on how these groups differ in their quality ratings*. The number of clusters was decided on the basis of three criteria – the overall r-square, the pseudo F statistic and the pseudo $t^2$ statistic. The restaurants were first clustered using the centroid method; seven different clustering options, with of number of clusters ranging between two and eight, were considered. Figure 3 presents a plot of the r-square values against the number of clusters. The r-square values increased rapidly till the number of clusters reached four; increasing the number of clusters over four increased the r-square values only by relatively small proportions. Similarly, the pseudo F statistic peaked when the number of clusters was four. Pseudo $t^2$ statistics also showed similar trends. Based on these statistics, the optimal number of clusters was set at four.

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Insert figure 3 about here
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The restaurants were then cluster analyzed using SAS's PROC FASTCLUS procedure which does k-means segmentation (Punj and Stewart 1983). The 369 restaurants were mapped into four distinct clusters based on standardized perceived values of décor, service and log-price. The mean values for the attributes and the frequency of restaurants in each cluster are given in table 2.

**Table 2. Category Means of Restaurants Clustered on Price, Décor and Service**

| Cluster | Frequency | Log-Price | Decor | Service |
|---|---|---|---|---|
| Economy | 32 | -1.92 | -1.84 | -1.67 |
| Casual | 160 | -0.41 | -0.45 | -0.47 |
| Formal | 164 | 0.63 | 0.63 | 0.59 |
| Luxury | 13 | 1.98 | 1.95 | 2.38 |

Based on the attribute means, the four clusters of restaurants were classified as economy, casual, formal, or luxury restaurants. To examine the impact of this categorization on perceptions about quality of food, the food ratings[4] of these restaurants were subjected to a one-way ANOVA with restaurant subcategory as the independent variable. As predicted there was a main effect of subcategory on quality ratings ($F(1,365) = 45.3$, $p <.01$). The perceived quality of food in the economy restaurants did not differ from that in casual restaurants ($M_{economy} = -0.52$ vs. $M_{casual} = -0.40$; $p > .50$). However, the perceived food quality in formal restaurants was higher than that in casual restaurants ($M_{formal} = 0.35$; $p < .01$). Similarly, the perceived quality of food in the luxury restaurants was significantly higher ($M_{luxury} = 1.82$, $p < .01$) than that in formal restaurants. These results support the proposition that attribute-based categorization affects the prior odds of perceived quality.

3.3. Categorization and Price-Quality Distribution

We also examined how the price-quality likelihood ratio varied across categories. The four clusters were collapsed to form two groups, so that each group had enough data points to give stable regression coefficients. The economy and casual clusters were combined to form a single group and the formal and luxury clusters were combined to form the other group. Then for each of the two groups, the standardized food quality rating was regressed on the standardized log-price ratings. Figures 4a and 4b depict the plot of quality ratings and prices in each group.

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Insert figures 4a and 4b about here
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For formal/luxury restaurants, price was a significant predictor of food quality ($\beta = 0.85$, $p <.01$; $R^2 = 0.29$); the higher the price, the higher was the perceived food quality.

[4] Instead of considering analog ratings, we can estimate the odds of high quality by converting quality perceptions into a dichotomous variable. However, we think it is unlikely that consumers actually assess odds of

However for economy/casual restaurants, price did not predict quality ratings ($\beta = 0.04$, $p > .58$; $R^2 = 0.001$). This implies that within the economy/mediocre cluster, price distributions of high and low quality restaurants are indistinguishable. So consumers would be more inclined to use "the higher the price, the better the product" decision rule for formal/luxury restaurants than for casual/economy restaurants. A chow test confirmed that the two regressions models were significantly different from each other ($F(2, 365) = 27.89$; $p < .01$).

3.4 Discussion

Two interesting empirical observations emerged from analysis of the survey data on perceived quality. Consumers not only believe that formal/luxury restaurants have greater odds of high quality but the price-quality likelihood ratios for these restaurants are also higher than those for economy/casual restaurants. The observation that quality perceptions systematically vary across clusters of restaurants grouped on the basis of décor, service and price supports our proposition that attribute based categorization affects expectations of perceived quality. Second, our finding that a positive correlation between price and perceived quality manifested only for formal/luxury restaurants suggests that consumers' are more likely to use the "higher the price, better the product" for these types of restaurants. These two findings suggest that when quality is more important than price, then a high price should increase the revenues of a formal/luxury restaurant but not that for a casual/economy restaurant. In the next study, we use an experimental paradigm to directly test this proposition.

**4. Study 2: An Experimental Investigation of the Value Judgment Process**

This study tests all the major propositions of the signal detection model of price-value judgment using an experimental paradigm. The stimulus was a new restaurant and we

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high quality. We think it is more likely that they base their judgments on perceptions of quality as recorded on an manipulated three factors: price, category cue and the importance of quality in consumption. We predict that:

(i) a higher price will enhance perceived quality only when the category cue suggests the restaurant is a high quality one; price will not affect perceived quality when the category cue suggests the restaurant is a mediocre one.

(ii) a higher price will increase intentions to dine at that restaurant only for those occasions when perceived quality is more important than price evaluation.

## 4.1 Experimental Design

The effects of categorization and usage occasion on price-quality inferences and demand were examined using a 2x2 between-subjects design. The two factors manipulated were restaurant category (formal vs. casual) and the level of prices on the restaurant menu (high vs. low). Participants were told that the experimenters were interested in their opinion about a new restaurant called Hudson's Bounty. They were given two different pieces of information about the restaurant – a restaurant review and the menu.

The categorization information was embedded in a one-page review, ostensibly from a local newspaper. The review was quite extensive. It had comments on the chef, the ingredients that go into the food, atmosphere, ways to pay and hours of operation. The reviews were identical in all the four between-subject conditions except for one sentence. In the formal category conditions, one of the sentences in the review read: "Hudson's Bounty is appropriate (if not ideal) for business dinners or anniversaries and other romantic evenings." In the casual category conditions, this sentence was replaced by: "Hudson's Bounty is appropriate (if not

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internal analog quality scale.

ideal) for a casual dinner with friends or family." It may be noted that of the 21 sentences given in the review only this sentence differed across the two different categorization conditions.

The price information was embedded in the restaurant menu. Participants saw a restaurant menu with details of appetizers, entrees and desserts. There were five choices of appetizers and entrees each, and six choices of desserts. The price of each dish was listed alongside its description (e.g., "Lettuce with anchovy, garlic, and pounded parsley, $4.00.") In the high price condition, the prices of the food items were in the range of $8.00 to $29.00. In the low price condition, the prices of food items were in the range of $3.25 to $11.50. The descriptions of the food items remained identical in all the conditions, only the prices changed.

## 4.2 Dependent Variables

*Purchase Intent*. The primary dependent variable was purchase intention. Purchase (dining out) intentions were measured for two different purchase occasions; one was a quality-important purchase occasion (dinner with a date) and the other a quality-unimportant purchase occasion (a casual dinner). Thus the quality importance factor was manipulated within subjects. On a three-item, seven-point semantic differential scale, participants indicated how likely they were to have a "casual dinner" with friends at Hudson's Bounty. They also indicated how likely they were to have "dinner with a date" at Hudson's Bounty. The response scales were anchored at "Not at all likely – Very likely", "Definitely would not – Definitely would" and "No chance - Good chance."

*Process Measures*. Other than the two primary dependent variables, three other dependent variables were recorded as process measures. In order to study the effect of the categorization process, the perceived similarity to formal restaurants was measured on a six-item, seven-point semantic differential scale anchored at “Dissimilar – Similar.” Participants reported how similar was the described restaurant to a casual restaurant, inexpensive restaurant, formal restaurant, fancy restaurant, expensive restaurant, and restaurant for business people. Second, perceptions about the quality of food in the restaurant were measured using a four-item, five-point Likert scale. Participants indicated their agreement with four statements about food quality: restaurant offers high quality food, recommend this restaurant for the quality of food, uses high quality produce in their kitchen and overall quality seems to be high. Finally, participants also reported their satisfaction with the price (price evaluation) on five-item semantic differential scales. The five items were “unfair – fair,” “cheap-expensive,” “bad deal –good deal,” “bad value –good value,” and “unreasonable – reasonable.”

### 4.3 Participants and Procedure

One hundred and ninety two undergraduate students at a large Northeastern U.S. university participated in the experiment in return for partial course credit. The experiment was administered in conventional paper and pencil mode. The participants were randomly assigned to one of four conditions and were presented with a booklet containing the stimuli and the questions. The presentation order of the restaurant review and menu was manipulated such that half the participants saw the menu first while the other half saw the review first. After reading the review and the menu, the participants responded to questions about their purchase (dining out) intentions. Subsequently they answered questions about perceived similarity, perceived cost and perceived quality. Participants took an average of fifteen minutes to respond to the questions.

4.4 Results

The order manipulation did not have any effects on quality; neither the main effect nor the interactions reached significance. Therefore the data were analyzed after collapsing across the order conditions.

*Purchase Intentions*. As reported before, participants' intentions to dine-out at the restaurant were measured for two different purchase occasions- dinner with a date and a casual dinner. It was hypothesized that since the relative importance of quality is greater in the former situation, participants will use the high price-better quality decision rule only in the former situation.

The two purchase intentions were subjected to 2x2x2 mixed factorial ANOVA with purchase occasion (date-dinner vs. casual-dinner) as a within subject factor and price (low vs. high) and category (formal vs. casual) as between subject factors. The three-way interaction between usage occasion, price and category was significant ($F(1, 185) = 5.88$, $p < .02$). Univariate analysis showed that the price-category two-way interaction was significant for date dinner ($F(1, 185) = 7.80$, $p < .01$) but this interaction did not reach significance for casual dinner ($F < 1$). The pattern of means suggests that higher price increased demand for the quality-important purchase occasion (i.e., the date), but did not do so for the quality unimportant purchase occasion (i.e., the casual dinner). The pattern of mean purchase intentions is depicted in Figures 5a and 5b.

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Insert figures 5a and 5b about here
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When participants were considering going to the restaurant for a formal dinner (and therefore quality was more important than price), and the review indicated that the restaurant was a formal one, then the higher the price, the more participants intended to dine out with their dates at that restaurant ($M_{high}$ = 5.23 vs. $M_{low}$ = 4.28, $F(1, 185) = 7.84$, $p < .01$). However, when the review indicated that the restaurant was a casual one, then an increase in price did not change the participants' intentions to dine there with their dates ($M_{high}$ = 3.85 vs. $M_{low}$ = 3.47, $p > .25$). Thus, category information moderated the effect of price on demand when quality was relatively more important than price.

However, when participants were considering going to the restaurant for a casual dinner, since price was more important than quality, category did not moderate the effect of price on casual-dinner intent ($F < 1$). Instead, there was a main effect of price suggesting that irrespective of restaurant-category, participants preferred the lower priced restaurant ($M_{high}$ = 3.53 vs. $M_{low}$ = 4.57, $F(1, 185) = 20.12$, $p < .01$). Similarly, a main effect of review suggests that irrespective of price, the participants preferred the casual restaurant ($M_{formal}$ = 3.33 vs. $M_{casual}$ = 4.77, $F(1, 185) = 38.4$, $p < .01$).

*Relative Importance of Quality and Price evaluation*. In order to verify that it is the relative importance of quality that prompted participants to use different decision rules for the two occasions, purchase intentions for both occasions were separately regressed on price evaluation and perceived quality. (Since the four measures of quality were correlated with alpha = 0.86, they were averaged to form one composite index. Similarly, a composite price evaluation score was formed by averaging the five items that measured price satisfaction; alpha = 0.85.) The regression equations for both date and casual dinner are given below.

$$Date\_Dinner\ Purchase\ Intent = 0.27 + 1.18^{**}\ (Quality) - 0.15\ (Price\_Evaluation)$$

$$(F\ (2, 183) = 20.9,\ p < .01)$$

$$Casual\_Dinner\ Purchase\ Intent = 1.78 + 0.08\ (Quality) - 0.44^{**}\ (Price\_Evaluation)$$

$$(F\ (2, 183) = 5.6,\ p < .01)$$

In the case of dinner with a date, only the quality coefficient was significant; while in the case of a casual dinner only the price evaluation coefficient was significant. The pattern of coefficients suggests that the relative importance of quality differed across the two purchase occasions.

*Effect of Category Cue on Similarity and Quality Perceptions*. It was hypothesized that the category cue will affect similarity perceptions. Further, it was also hypothesized that these similarity perceptions would affect expectations of quality. These assumptions were validated in study 1 using survey data. Both these assumptions were tested again using the process variables measured in the experiment.

First, the six measures of perceived similarity were averaged to form a single perceived similarity measure after appropriate coding (alpha = 0.88). The perceived similarity measure was submitted to a 2 x 2 analysis with category (formal vs. casual) and price (high vs. low) as the two factors. Both category description ($F(1,186) = 68.4$, $p <.01$) as well as menu price ($F(1,186) = 36.8$, $p <.01$) had main effects on perceived similarity supporting the predictions of Tversky's (1977) contrast model. The perceived similarity to formal restaurants was higher when the category was described as formal rather than casual ($M_{formal} = 4.90$ vs. $M_{casual} = 3.72$). Similarly, the perceived similarity to formal restaurants was higher when the price was high rather than low ($M_{high} = 4.75$ vs. $M_{low} = 3.88$). Thus the assumption that all salient cues, including price, would affect the perceived category of the product was validated.

In order to examine the effect of categorization on perceived quality, the perceived similarity and category variables were converted into dichotomous variables through median splits. As with the Zagat study, we also found that in this dataset categorization affected quality perceptions. When the restaurant was perceived to be similar to formal restaurants, then 66.3% of the participants perceived the restaurant's quality to be above the median quality. But when the restaurant was perceived to be similar to causal restaurants, only 48.9% of the participants perceive d the restaurant's quality to be above the median quality. The chi-square reached significance ($\chi^2$ (1) = 5.78, p < .02).

*Perceived Quality Mediated the Effect of Price on Demand*. A mediation analysis showed that perceived quality mediated the price by category interaction effect on date-dinner intentions. In other words, the reason why price and category information affected demand as described above was because these factors influenced participants' perceptions of restaurant quality. These quality perceptions in turn influenced demand. To test for this mediation, we followed Baron and Kenny's (1986) test for mediated moderation, which involves estimating the following three different regression models. First, date-dinner intention was regressed on price and category. As required in this test, the price by category interaction reached significance (β = 0.33, p < .01). Then perceived quality was regressed on the same predicting variables and, as required, the effect of price by category interaction on perceived quality also reached significance (β = 0.12, p < .02). Finally, as required for the third model, when the date-dinner intention was regressed on price and category, with quality as a covariate, then the effect of the price by category interaction on date-dinner intent no longer reached conventional levels of significance (β = 0.21, p > .06); but the effect of quality on date-dinner intent remained significant (β = 0.98, p < .01). Thus, for date-dinner, perceived quality mediated the price by category interaction. Perceived quality did not mediate the effect of price-category interaction on casual-dinner because category did not moderate the effect of price on casual-dinner intent (F < 1).

### 4.5 Discussion

The results of this experiment provide strong support for the predictions from the signal detection model of price-value judgment. The three-way interaction observed in this study suggests that purchase intentions for a higher priced product were moderated by two factors – the expectation of quality based on categorization cues and the relative importance of quality based on the usage occasion. When quality was relatively more important, category perceptions moderated the effect of price on demand. This moderating effect of categorization was mediated by perceived quality. However, when quality was relatively less important, then categorization did not affect quality perceptions or demand. The pattern of means of purchase intentions, perceived quality and perceived similarity, together with the process measures and the mediation analyses support H1 and H2.

## 5. General Discussion

Together, the two empirical studies presented in this paper offer insights into the price quality judgment process that underlie value judgments. Study 1 shows that the product categorization process moderates the probabilistic judgment of quality as well as the relationship between price and perceived quality. Study 2 maps out the links between price, perceived quality and perceived value by examining when a higher price leads to greater purchase intentions. When faced with a high priced product of uncertain quality, consumers ask three questions regarding the category: (i) What is the proportion of high quality in the category? (ii) Given that judgmental errors are inevitable, which of the two errors should I minimize – the error of rejecting a high quality product or the error of buying an inferior quality product (iii) Are high prices equally likely with mediocre and high quality products?

*Managerial Implications*. This research has important implications for managers. Managers are often confronted with the question – can we increase revenues by increasing price? The signal detection model of consumers' value judgment can help managers design the appropriate market research studies to answer such a question. Our results suggest that higher prices will not always decrease, and may in some cases increase demand. Figure 6 presents a flow chart that summarizes the decisions involved in designing and interpreting such a market research program. Although the exact research methodology will depend on the specific product category and available data sources, at a broad level such research should address the following two research questions.

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Insert figure 6 about here
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Research Objective I – Assess the relationship between perceived quality and price. This step entails determining the perceptual clusters that consumers use to subcategorize products and assessing the correlation between price and perceived quality in each cluster. If the product is perceived to be in a mediocre-quality cluster then a price increase is unlikely to increase demand. However, even in such cases, it may be possible to reposition the product in consumers' perceptual space by altering some of the attributes. For instance, in the Zagat guide we observed a restaurant with a food quality rating of 0.36 and décor rating of 0.43, that are comparable to that of many formal restaurants (mean food quality and décor ratings for the formal cluster are 0.35 and 0.63 respectively). This particular restaurant might be able to reposition itself as a formal restaurant by improving its service ratings. But for the bulk of the products that fall in the mediocre-quality category, a price increase is unlikely to increase perceived quality or demand. On the contrary, if the product is perceived to be in a high-quality cluster then a price increase may enhance consumers' quality perceptions. In such cases, the next step would be to assess the relative importance of perceived quality.

Research Objective II – Assess the relative importance of perceived quality and price evaluation. If price evaluation is more important than perceived quality for the target consumers of the product, then a higher price may not lead to higher demand. A higher price will lead to higher revenues only when both conditions are satisfied - when the product is perceived to be in a high quality cluster and when quality is perceived to be more important than price evaluation. In the Zagat guide, seven of the 164 restaurants in the formal cluster had prices that were considerably lower than the mean price for the cluster. But these seven restaurants had high ratings on service, décor and food quality. We would recommend these restaurants investigate whether their potential and present consumers are more sensitive to changes in quality or to changes in price evaluation. Managers might be able to determine this, for example, through survey items that measure the importance of getting a low price, and the importance of getting high product quality on purchase decisions. If the customers are relatively more sensitive to changes in perceived quality, then a price increase might actually increase the revenues of these restaurants.

The signal detection model of price-value judgment provides a convincing account for why higher prices lead to higher demand for the products cited in the introduction of this paper. For example, at $79 Minivac 601 was categorized as a digital toy and corporate managers had little perceived value for toys. When the Minivac 6010 was introduced at $479 with some design changes that gave it a more serious appearance, then it was categorized as a corporate training tool. There appeared to be a stronger price-perceived quality relationship for corporate training tools rather than for toys. Further, the relative importance of price evaluation and perceived quality likely differs in these two categories, with quality being more important for a corporate training tool and price being more important for a toy. As a consequence of these differences, Minivac 6010 at $479 was perceived to offer a better value than Minivac 601 at $79.

*Theoretic Implications*. The price-value judgment model developed in this paper can account for many of the previously demonstrated effects of brand name, store name and other product cues (Jacoby and Olson 1985, Rao and Monroe 1989) on perceived quality. Brand, store name and other product cues are attributes that affect the categorization of the product. The model can also account for the effect of prior knowledge (Rao and Monroe 1988) as well as that of advertising (Kirmani and Wright, 1987). Prior knowledge and advertising messages may affect how the product is categorized, and experiential advertising can also influence the relative importance of price or quality in consumption.

Several issues that could not be addressed in this paper might serve as fruitful areas for future research. We relied on survey and laboratory data to examine the price-value relationship. Survey data offers the advantage of being collected from actual consumers. Laboratory data offers the advantage of internal validity, which is a necessary proviso for theory testing. Future research should examine empirical data collected from market experiments to test the external validity of the findings reported here. Future research should also examine how this signal detection model can be adapted to product categories other than restaurants. Categorization is a quite complex cognitive process; in this paper we restricted our attention to the affect of salient cues on perceived product category. Rao and Monroe's (1988) result suggests that prior knowledge can also influence categorization; however the precise relationship between prior knowledge and category perceptions remains unexplored.

More research is required to understand the antecedents and consequences of categorization in the context of value judgments.

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**Figure 1. A Hypothetical Distribution of Signal and Noise**

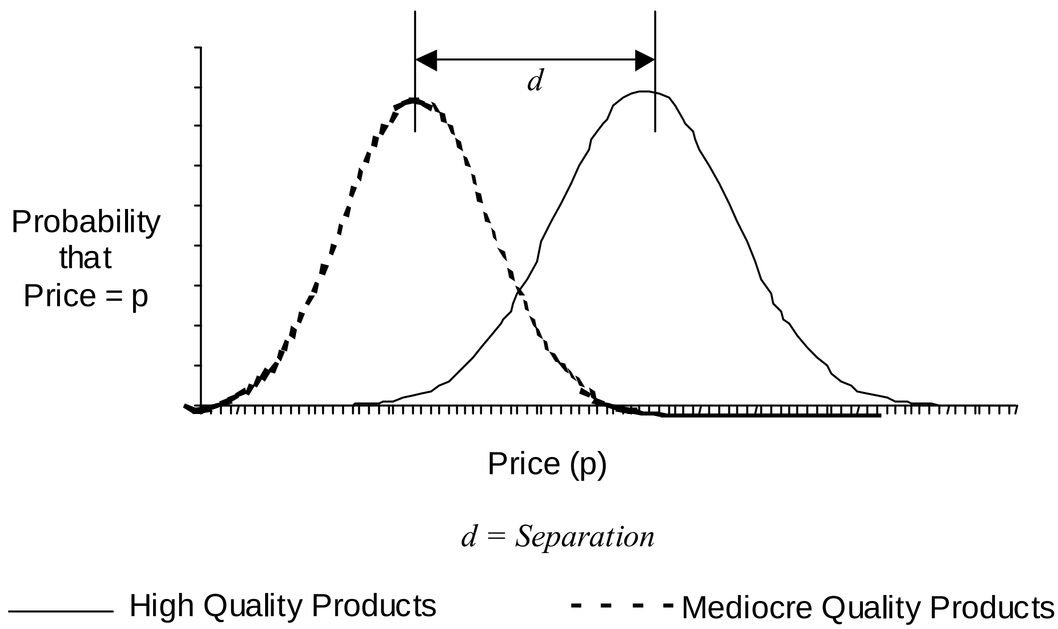


**Figure 2. Attribute Based Categorizing and Quality Expectations**

Consumers categorize products based on the attributes that are common and distinctive between the product and category. While the prior odds of high quality depend on beliefs about the proportion of high quality products in each subcategory, the conditional likelihood of high price depends on the correlation between price and perceived quality within each subcategory. Subcategory 2 not only has greater proportion of high quality products, but quality is positively correlated with attribute 2.

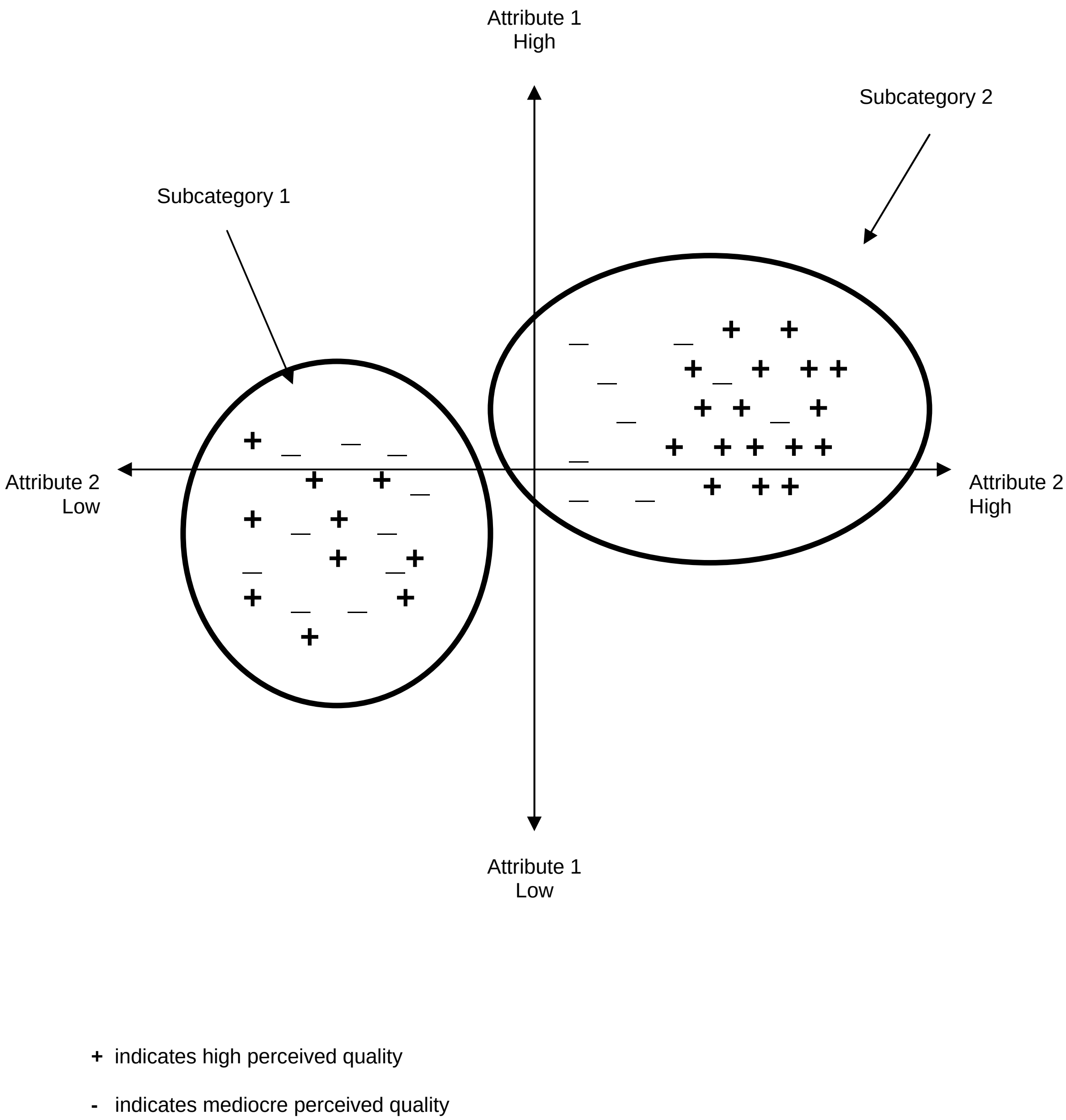


**Figure 3.**

**Effect of Number of Clusters on R-Square and PSF**

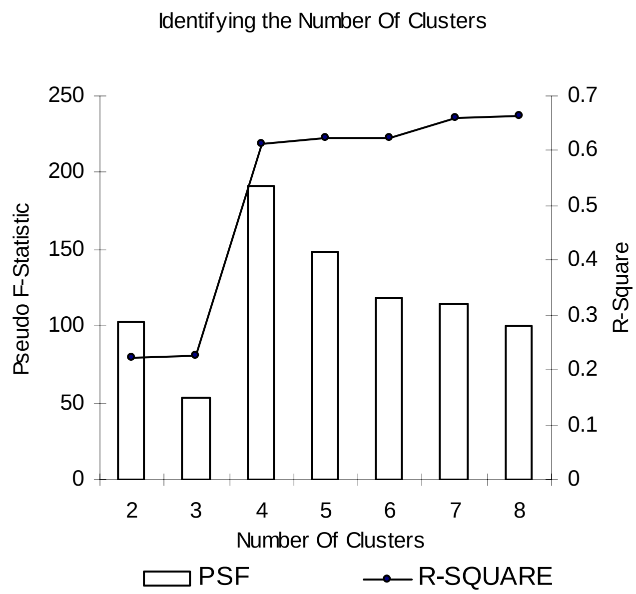


**Figure 4a.**
In the Formal/Luxury Subcategory, Higher Price is Associated with High Perceived Quality*.

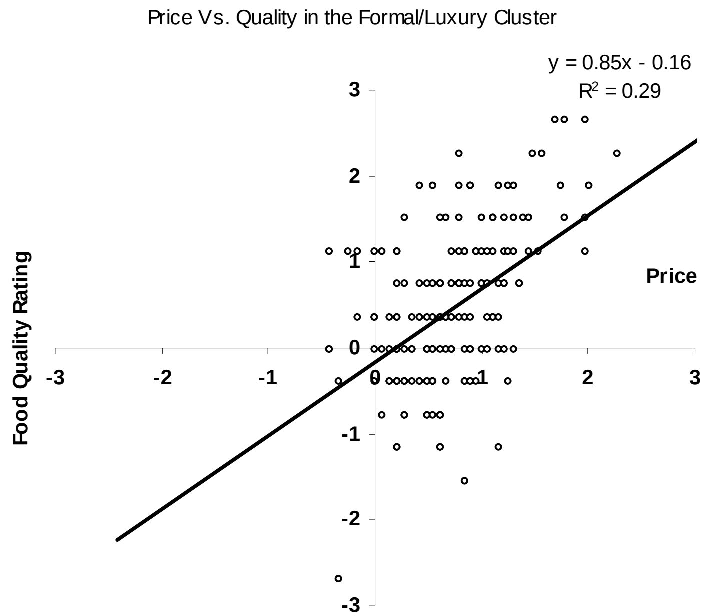
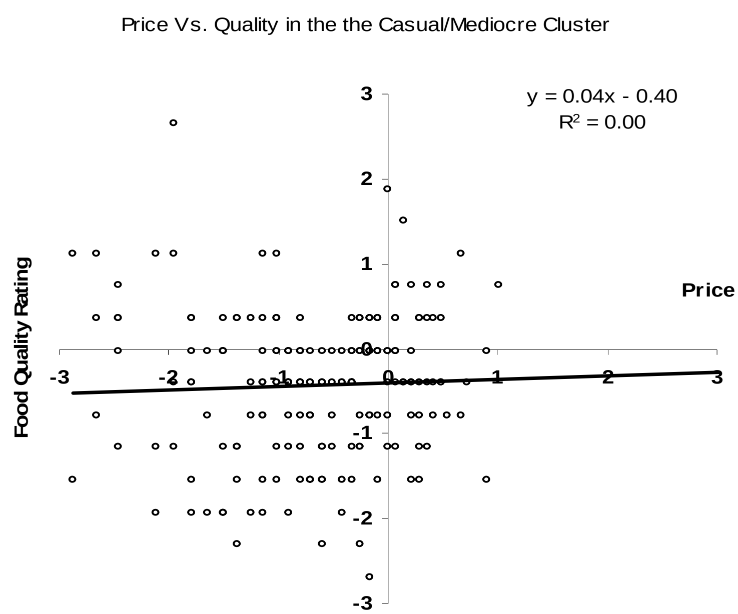



**Figure 4b.**
In Casual/Economy Quality Subcategory, Price and Perceived Quality are Not Correlated*




* - The ordinate and abscissa are standardized values of quality ratings and log-price respectively.

**Figure 5a. Formal Dinner**

In the case of a formal dinner, a higher price increased intentions to dine at that restaurant only when the category cue suggested that the restaurant offers high quality.

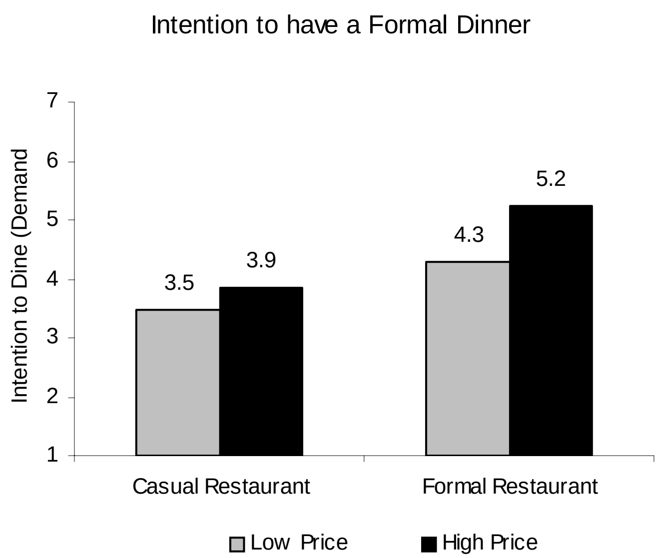



**Figure 5b. Casual Dinner**

In the case of a casual dinner, a higher price did not increase demand even when the category cue suggested high quality.

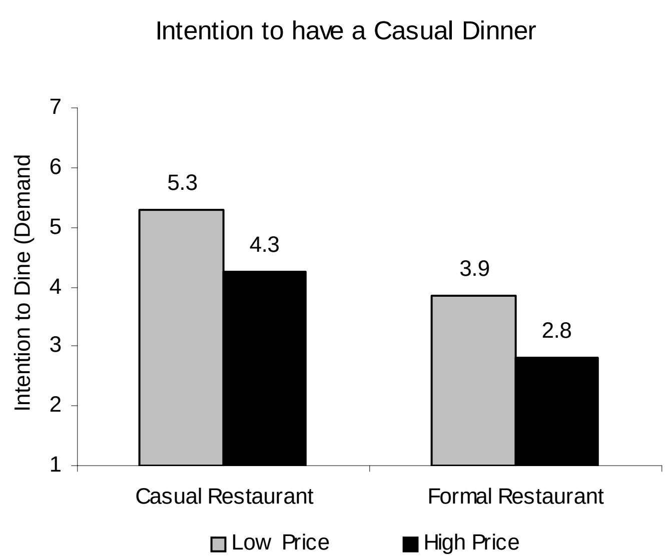


**Figure 6.**

A Flow Chart for Managerial Decision Making