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Divide and Prosper: Effects of Partitioned Prices on Consumers' Price Recall and Demand

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When charging consumers for goods or services, many companies divide the price into two components: a large *base price* and a comparatively small *surcharge.* They surmise that this price partitioning will increase consumers' demand for the product. However, little research has been done on how consumers react to partitioned prices and whether or not such pricing generates more demand than combined pricing.

Study

In this study, authors Morwitz, Greenleaf, and Johnson examine how consumers process partitioned prices and how partitioned pricing affects consumers' demand and their recalled prices.

Processing a partitioned price requires more cognitive effort than processing a combined price—effort that consumers may not be willing to expend. If consumers do not go to the trouble of calculating the total cost of the product, the authors theorize, they are likely to recall the total cost as less than it really is. This should lead to greater demand for the product when it has a partitioned price than when the same product has a single, all-inclusive price.

Furthermore, some partitioned-price strategies make calculation more difficult than others. The authors hypothesize that a surcharge presented as a percentage of the base price will lead to fewer attempts at calculation than will a surcharge presented as a dollar amount. Finally, the authors speculate that consumers' feelings for a product's brand name influence their recalled prices and their demand when looking at partitioned prices.

Results and Implications

Evidence from experiments reveals that partitioned prices do tend to increase consumers' product demand compared with all-inclusive, combined prices. The results also show that consumers recall significantly lower prices when exposed to partitioned prices than when exposed to combined prices. Less than one quarter (21.9 percent) of the subjects in one experiment tried to calculate the total cost represented by a partitioned price, while 23.2 percent of the subjects ignored the surcharge altogether. In an experiment using both percentage surcharges and dollar surcharges, only 9.6 percent of the subjects attempted to calculate the total cost of a product with a percentage surcharge, whereas 32.9 percent attempted calculation

when the surcharge was given in dollars. Results also indicated that the increase in demand due to partitioned pricing increased with consumers' a priori likelihood of purchasing a given brand, as measured by their relative affect for the brand compared with an alternative.

Overall, the results suggest that partitioned pricing can be effective in increasing demand for a product. Further research might address how to design optimal partitioned-pricing strategies and how such strategies affect perceptions of fairness. In addition, public policy makers may consider policy guidelines for ethical use of partitioned pricing.

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Introduction

Many firms divide the prices they charge consumers into two mandatory parts instead of charging one all-inclusive price. For example, a mail-order firm charges $32 for a shirt plus $4.95 for shipping and handling. A restaurant's menu lists a price of $34 for a prix fixe dinner and mentions that a gratuity of 18 percent will be added automatically for parties of six or more, while smaller parties are expected to add a tip. A travel agency lists a price of $1,295 for a Caribbean cruise and charges an additional $140 to cover mandatory "port charges." In each case, the firm could charge a single, all-inclusive price—$36.95 for the shirt, $40 for the dinner, or $1,435 for the cruise—but instead divides the price into two parts, a strategy we term *partitioned pricing*. Because we deal with cases in which one price component is much larger than the other, we call the larger component the *base price* (e.g., $32 for the shirt) and the smaller component the *surcharge* (e.g., $4.95 for shipping and handling).[1]

Firms presumably use partitioned pricing because they believe the strategy increases consumers' demand for their products. If consumers attend to and process both base prices and surcharges with the same accuracy as equivalent combined prices, then partitioned prices should not increase demand. However, pricing research provides evidence that consumers do not always completely attend to, or accurately process, price information (Dickson and Sawyer 1990; Mazumdar and Monroe 1990, 1992; Stiving and Winer 1997). If consumers do not completely and accurately process base prices and surcharges, then partitioned pricing may indeed increase demand.

However, little research has been done on how consumers react to partitioned prices, either cognitively or behaviorally, leaving unanswered the important questions of how consumers process partitioned prices and whether these prices actually generate more demand than combined prices.[2] If partitioned pricing is effective, then managers must learn why. Then they can create partitioned-pricing strategies that maximize profits in an ethical manner. Since partitioned prices have the potential to mislead consumers when they are not made salient (McDowell 1996; *Travel and Leisure* 1996), public policy makers also need to understand how consumers perceive and react to partitioned prices.

The purpose of this paper is to investigate these issues. We develop hypotheses to explain how consumers react to partitioned prices based on the literature on cost-benefit tradeoffs. We then test these hypotheses in two experiments. We find that consumers exposed to partitioned prices have greater demand for the product or service than consumers exposed to all-inclusive, combined prices that represent the same total cost. Our results suggest that this occurs because a large proportion of consumers do not take surcharges fully into account, and therefore they underestimate the total product cost. We also identify two factors that affect how consumers process and react to partitioned prices: (1) the effort required, and (2) consumers' motivation to process partitioned prices fully and accurately.

In the next section, we develop our hypotheses. We then describe two experiments that test the hypotheses in two different contexts in which partitioned pricing is used. Finally, we discuss the implications of our findings for firms using partitioned-pricing strategies and for public policy makers, and we discuss study limitations.

Consumer Response to Partitioned Prices

How Consumers Process Partitioned Prices: A Cost-Benefit Perspective

In order to process a partitioned price, consumers must combine price information from the base price and the surcharge to estimate the product's total cost. The manner in which they do this affects the "psychological price" they remember, which in turn affects demand (Monroe 1973; Dickson and Sawyer 1990). Thus, how consumers process partitioned prices has important implications for marketing practice.

We believe that in a given situation, consumers can use different methods to process partitioned prices. While there are a number of ways to conceptualize the variations in how consumers process partitioned prices, we feel that it is helpful to examine these variations using a cost-benefit framework (Beach and Mitchell 1978; Shugan 1980; Johnson and Payne 1985) wherein consumers choose from among several different strategies for solving problems. Consumers select a strategy for a particular task by making tradeoffs between the perceived benefits and the perceived costs of each strategy. For processing partitioned prices, a strategy's benefit is the increase in the consumer's ability to process the partitioned price accurately. A strategy's cost is the time and cognitive effort that it will require. The strategy that a consumer selects depends on his or her perceptions of these costs versus benefits (i.e., accuracy versus effort).

Thus, we believe that it is useful to examine how various processing strategies differ in the effort they require and the accuracy they deliver, which depends on the weight they place on the base price compared to the surcharge. While we allow for the possibility that some consumers will weight equally each dollar of base price and surcharge, we believe that others will weight these components unequally. In the latter case, even though a product presented with a combined price has the same total cost to the consumer as one presented with a partitioned price, the consumer may recall different total costs for the two products.

We can divide processing strategies into three general types that differ on how the base price and surcharge are weighted and combined. Each strategy requires a different amount of cognitive effort and delivers a different degree of accuracy in estimating the total product cost. The processing strategies are:

1. Calculate the total price as the mathematical sum of the base price and the surcharge. When the addition is done correctly, the price consumers recall for partitioned prices and equivalent combined prices should be identical. Consequently, partitioned pricing should have no impact on consumers' recalled prices or demand. This process is assumed by theories that presume descriptive invariance (Tversky, Sattath, and Slovic 1988), such as classical economics. While this strategy leads to the most accurate price recall, it also requires the greatest cognitive effort.

2. Use a heuristic to combine the base price and surcharge. Consumers may regard the base price and surcharge as separate pieces of information or as separate attributes of the product. When consumers must integrate two or more pieces of product information to form an overall judgment, they sometimes use simplifying heuristics rather than engaging in more accurate but more difficult mental arithmetic (Hitch 1978).

We cannot specify the exact nature of the combination heuristic that a given consumer will use, and there are several possible heuristics that consumers may use to process partitioned prices. We also note that heuristic processing strategies can lead consumers to give the surcharge either greater or lesser weight than a calculation strategy would. For the following reasons, however, we believe that in the aggregate consumers will tend to use heuristics that combine the base price and surcharge in a manner such that recalled prices will be *less* than the mathematical sum of the two prices. In these cases, partitioned pricing will tend to reduce recalled prices and increase demand.

One specific heuristic that many consumers appear to use to process partitioned prices is *anchoring and adjustment,* which has been identified as a method consumers can use to simplify the task of processing multiple pieces of information (Tversky and Kahneman 1974; Chapman and Johnson 1996). Decision makers often overweight the anchor information and make insufficient adjustments for the remaining information (Lichtenstein and Slovic 1971; Tversky and Kahneman 1974; Jacowitz and Kahneman 1995; Wilson et al. 1996).

In partitioned pricing, we believe for the following reasons that consumers tend to anchor on the base price and then adjust insufficiently upward when incorporating the surcharge. First, decision makers often anchor a perception on the first piece of information they encounter and then adjust for later information (Tversky and Kahneman 1974; Hogarth and Einhorn 1992). In the context of partitioned prices, consumers are generally exposed to base prices prior to surcharges—as when reading through a catalog, for example. Second, there is evidence that people tend to anchor on the piece of information that they perceive is most important and then adjust this perception for less important information (Yadav 1994). If consumers feel that the surcharge is less important than the base price (e.g., because surcharges tend to be much lower than base prices), they will again tend to anchor on the base price and adjust insufficiently for the surcharge.

Thus, if consumers do use anchoring and adjusting heuristics to process partitioned prices, they will tend to recall the price as *less* than the mathematical sum of its two components. In such a case, price partitioning will tend to reduce recalled prices and increase demand. Consumers may justify using this simplifying heuristic despite its downward price biases because it requires less cognitive effort than is required for calculating the total price.[3]

3. Ignore the surcharge completely. Consumers also may ignore the surcharge information, either by not noticing it at all or by noticing it but not incorporating it when recalling product prices. This is especially likely when the surcharge is presented physically or temporally distant from the base price. It

may, however, occur even when the surcharge is presented near the base price. Kahneman and Tversky (1979) suggest that eliminating information, even when it is readily available, is one of the editing operations people may use when evaluating prospects. Furthermore, consumers often use incomplete information search and may not process information on some attributes, especially unimportant ones. For example, Stiving and Winer (1997) found that consumers tend to process supermarket prices from the left-most digit to the right-most digit, and that they often ignored the right-most (i.e., the pennies) digit when making brand choice decisions. They speculate that consumers may weigh the cost of thinking about the pennies digit against the value inherent in the additional information it provides.

Similarly, in the partitioned-pricing context, consumers may believe that the extra thinking required to process the surcharge may not lead to significantly better decisions, and they may therefore decide to ignore the surcharge. When consumers completely ignore the surcharge, they will recall the base price as the total cost. That price will be even lower than the price recalled using any of the heuristics strategies that give any weight to the surcharge. The ignoring strategy, therefore, requires less cognitive effort than either the calculation or the heuristic strategy, but it also provides the least accuracy.

In conclusion, consumers who completely ignore the surcharge will recall lower prices than consumers who use a calculation strategy. While the prices recalled by consumers who use a heuristic can be less than the base price, in between the base price and the sum of base plus surcharge, or even greater than this sum, we expect that in the aggregate recalled prices will be less than this sum but greater than the base alone. Since we expect that some consumers will use a heuristic strategy or an ignoring strategy to process partitioned prices, even if some use a calculator strategy, we expect that, on average, recalled prices will be lower among consumers who see partitioned prices than among consumers who see combined prices with equivalent total cost.

Impact of Partitioned-Price Strategies on Demand

Consumers' demand for most products increases as the price they recall for the product decreases, provided the decrease occurs within consumers' latitude of price acceptance (Monroe 1971, 1973; Lichtenstein, Bloch, and Black 1988). In the context of partitioned pricing, the combined price must be less than the high end of the latitude, which is the consumer's reservation price, while the base component of the partitioned price must be greater than the low end of the latitude, which represents the lowest price at which the consumer still perceives the product to have adequate quality. When the constraint imposed by the latitude of price acceptance is adhered to, the lower recalled prices associated with partitioned pricing should lead to greater demand. Thus:

H_1: In the aggregate, consumers will have greater demand when a product has a partitioned price than when it has a single, combined price with the same total cost.

As described above, consumers will have greater demand when a product has a partitioned price because some consumers will process partitioned prices in a manner that leads them to underweight the surcharge and thus underweight the total product cost. Thus:

H_2: In the aggregate, consumers will recall lower prices when they see a partitioned price than when they see a single, combined price that results in the same total cost.

Next, we discuss factors that may influence the impact of partitioned pricing on consumers' price processing, recalled prices, and demand.

Impact of the Effort Required to Process Partitioned Prices on Processing Strategy, Recalled Prices, and Demand

The cost-benefit framework suggests that when the costs associated with fully and accurately processing partitioned prices are high, consumers will tend to use lower-effort processing strategies. The effort required to process partitioned prices can be affected by how the firm presents the partitioned-price information. Thus, an important question for marketers is whether the manner in which partitioned prices are presented, especially the surcharge portion, influences the strategy consumers use to process them.

In practice, surcharges are often presented to consumers in dollar terms, such as $4.95 for shipping and handling for a $32 mail-order shirt. Sometimes, however, they are presented as a percentage of the base price, such as 15.5 percent for shipping and handling. Consumers must expend more cognitive effort to calculate the total price mathematically if the surcharge is presented as a percentage because it requires a multiplication operation (multiplying $32 by .155) or both a multiplication and an addition operation (multiplying $32 by .155 and then adding the result to $32). That is more demanding than simply adding $32 and $4.95 because multiplication operations typically require significantly more cognitive effort than addition operations (Chase 1978; Bettman, Johnson, and Payne 1990). Furthermore, variations in the cognitive difficulty of mathematical operations can lead consumers to use different processing strategies (Johnson, Payne, and Bettman 1988).

This suggests that consumers will be more likely to use the lower-effort heuristic or ignoring strategies to process partitioned prices when the surcharge is presented as a percentage than when it is presented as a dollar amount. Thus:

H_{3a}: When the surcharge is presented as a percentage of the base price, consumers are more likely to use a heuristic or ignoring strategy to process the partitioned price than when the surcharge is presented as a dollar amount.

When more consumers use a heuristic or ignoring strategy, we expect that in the aggregate this will lead to lower recalled prices and increased demand. Thus:

H_{3b}: When the surcharge is presented as a percentage of the base price, consumers will recall lower prices than when the surcharge is presented as a dollar amount.

H_{3c}: When the surcharge is presented as a percentage of the base price, consumers will have greater demand than when the surcharge is presented as a dollar amount.

Impact of Consumers' Motivation to Process Partitioned Prices on Processing Strategy, Recalled Prices, and Demand

The strategy that consumers choose to process partitioned-price information will also depend on their perception of the likelihood that they will purchase the brand, as has been shown in pricing contexts such as bundling (Suri and Monroe 1995). For example, in a choice context, if consumers feel they are very unlikely to purchase one of the brands, they are unlikely to perceive much benefit in expending effort to process product information about that brand, because that information is unlikely to make any difference: it is unlikely to change their predisposition not to buy this brand. Similarly, consumers who believe that they are very likely to buy one of the brands will also have little motivation to expend effort processing information about it, because the new information is unlikely to change their decision to buy this brand. However, consumers who are relatively uncertain about which brand they will choose will be more willing to expend effort to process price information more fully and accurately because there is a greater chance that complete and accurate information will influence their purchase decision.

While several factors can influence consumers' perceived likelihood of purchasing a product, this paper will examine only one, a factor that often plays a role in choice situations. This is consumers' affect for a product's brand name relative to other brand names in the choice set. We refer to this factor as *relative brand-name affect.* This factor is relevant since consumers' affect for the brand name can transfer to the product. Thus, consumers whose affect for one brand name is high or low relative to their affect for other brands in the choice set should be less motivated to use the higher-effort calculation strategy to process partitioned prices for that brand than consumers whose affect for that brand is close to their affect for other brands. Therefore, we expect an inverted U relationship between consumers' relative brand-name affect for a given brand and the probability that they use a calculation strategy for partitioned prices for that brand. Thus:

H_{4a}: In a choice situation in which at least one brand uses partitioned pricing, consumers with high or low relative brand-name affect for that brand will be more likely to use a heuristic or ignoring strategy to process partitioned prices for the brand than consumers with moderate relative brand-name affect.

As the proportion of consumers who use an ignoring or heuristic strategy to process partitioned prices increases, recalled prices should decrease, as discussed in H_2. Since H_{4a} hypothesizes that relative affect for the brand name influences processing strategy, we consequently expect this affect also to influence the effect of partitioned pricing on recalled prices, resulting in an inverted U relationship between relative brand-name affect and recalled prices when partitioned prices are used. Thus:

H_{4b}: In a choice situation in which at least one brand uses partitioned pricing, consumers with high or low relative brand-name affect for that brand will have lower recalled prices for the brand than consumers with moderate relative brand-name affect.

While H_{4b} predicts that partitioned pricing will be related to lower recalled prices for consumers with low relative brand affect compared to combined prices, we expect this change in recalled prices will have little or no effect on these consumers' demand: they are unlikely to purchase the brand, regardless of its recalled price, because they have low affect for this brand relative to others in the choice set. By contrast, we expect that the lower recalled prices related to partitioned pricing for consumers with relatively high brand name affect will significantly increase these consumers' demand, since they were already more likely to purchase this brand than the other brands in the choice set and partitioned pricing leads to even lower recalled prices. Furthermore, we expect that the demand increase from partitioned prices will be greater for relatively high-affect consumers than for moderate-affect consumers since H_{4a} predicts that recalled prices decrease least of all for the latter. Thus:

H_{4c}: In a choice situation in which at least one brand uses partitioned pricing, the increase in demand associated with partitioned pricing will increase as consumers' relative brand-name affect increases.

We tested these hypotheses in two experiments involving different products and types of surcharges. This reflects the fact that, in practice, partitioned-pricing strategies are used for different products and services and are presented in different ways. We also designed the experiments to examine different types of consumer decisions. Specifically, the first experiment examines a decision regarding how much to bid for an item at auction. This experiment was designed to test H_1, the effect of partitioned pricing on demand in an actual purchasing context with real financial consequences for the participants. The second experiment examines a decision regarding which brand to choose from among competing alternatives and was designed to test why partitioned pricing affects demand (H_2), and factors that influence its effect (H_3 and H_4).

Experiment One: The Auction Experiment

Design

Many auctioneers charge a buyer's premium, a percentage of the winning bid that the winning bidder must pay in addition to that bid. Other auctioneers do not charge this premium.[4] This premium is an example of partitioned pricing. The auction experiment was designed to test H_1 by examining how the buyer's premium affects bids in an actual, sealed-bid auction of a jar of pennies. Here, an appropriate measure of consumer demand is the level of a consumer's bid compared to his or her perception of the monetary value of the pennies in the jar, since consumers will typically want to obtain the pennies for less than their perceived monetary value. We believe this experiment provides a strong test of H_1 because it examines the impact of partitioned pricing on consumer demand when consumers make an actual purchase if their bid wins.

The subjects were 199 graduate business students. Subjects were told they would be participating in a sealed-bid auction of a quart-jar of pennies. All subjects viewed the same jar full of pennies. Each subject received a sealed-bid form with written instructions, which they were told to read carefully, informing them of the conditions of their bid and how to submit it. The instructions told the subjects to determine how much they would be willing to bid for the jar of pennies and to enter that bid on their form. Subjects were told that the winning bidder had the option of receiving the pennies or a check for their monetary value.

Subjects were randomly assigned to receive one of two paper forms for submitting their bids. One form mentioned that subjects were to pay a buyer's premium of 15 percent in addition to their bid if they won. Specifically, these subjects were told, "If your bid is successful, the purchase price you must pay will be the sum of your bid plus a buyer's premium of 15 percent of that bid." Subjects receiving the control form were told, "If your bid is successful, the purchase price you must pay will be the bid you indicate on the form." After writing down their bid, subjects in both groups were also asked how much they felt the pennies in the jar were worth.

Results

We tested H_1 by calculating the ratio of each subject's total cost (defined as the amount of the bid plus any buyer's premium) to his or her perception of the value of the jar of pennies. We then compared this ratio for subjects receiving the buyer's premium form versus the form with no buyer's premium. If partitioned pricing does not affect demand, we would expect the ratios to be identical for the two groups. However, if partitioned pricing increases demand, then we should expect the subjects receiving the buyer's premium form to be willing to pay more (i.e., a higher percent of their perceived value) for the jar of pennies.

The results support H_1, that partitioned pricing increases demand. Subjects who received the buyer's premium form bid a total cost that is a significantly higher percent of their perceived value (total cost/perceived value = .885, n = 108) than subjects in the control group (total cost/perceived value = .787, n = 91; r = .023 [where r is the effect size; see Rosenthal (1991), pp. 14-20], $t_{194} = 2.17$, p = .014), based on a one-tailed test of two proportions.

These results demonstrate that partitioned pricing can increase aggregate demand for a product. The second experiment examines why partitioned pricing can increase demand (i.e., how partitioned prices affect recalled prices and processing strategies) and two factors that influence these effects.

Experiment Two: The Telephone Experiment

Design

The telephone experiment studied consumers' reactions to partitioned pricing for a product sold in a catalog when they can buy a similar product from a store. Many mail-order catalogs use a partitioned-pricing strategy whereby consumers must pay a shipping and handling charge in addition to the product's base price. Thus, this context is appropriate for testing the impact of partitioned pricing on recalled prices (H_2). Furthermore, while many catalogs state this surcharge as a dollar amount, others present it as a percentage of the base price. This provides an opportunity to test $H_{3a\text{-}c}$. In addition, many products sold in catalogs use well-known brand names, providing a good opportunity to test $H_{4a\text{-}c}$.

The subjects were 233 undergraduate business students. Subjects were asked to choose between two brands of telephones: a control phone sold at a store and a target phone sold through a catalog. In studying the hypotheses relating to brand name affect, we felt it was desirable to use products with real and well-known brand names. Therefore, we chose two brand names with high levels of awareness among the subject population. The control phone was a Sony described as having 10-number memory dialing, repeat dialing, built-in speaker, and a one-year warranty. It was available at a local store for $64.95, which included tax. The target phone was an AT&T with the same features, except that the warranty lasted for three years. It was available by mail order for $69.95 including tax, plus $12.95 for overnight shipping and handling.[5]

Subjects were randomly assigned to one of three groups. In all three, the store price of the control phone (Sony) was presented as one all-inclusive price. The catalog price of the target phone (AT&T) was presented in one of three different ways, which all created the same total product cost:

1. Combined price

   "$82.90, including shipping and handling"

2. Base price and surcharge in dollars

   "$69.95 plus $12.95 for shipping and handling"

3. Base price and surcharge in percentage terms

   "$69.95 plus 18.5% for shipping and handling"

Subjects first read descriptions and prices for the two telephones. To estimate the impact of partitioned pricing on demand, subjects indicated their choice intentions (i.e., their relative likelihood of choosing one phone over another) using a

10-point bipolar scale with anchors labeled "I would definitely buy the Sony phone" (1) and "I would definitely buy the AT&T phone" (10). On the next page, subjects were then asked to recall the total cost, including shipping and handling, for the AT&T (target) phone, and specifically instructed to do so without turning back the page. Next, to measure relative brand-name affect, subjects rated their general preference for Sony and AT&T products on a 10-point bipolar scale anchored at "I strongly prefer Sony" and "I strongly prefer AT&T."

Results

Testing the Effect of Partitioned Pricing on Recalled Prices (H_2). We tested H_2 by comparing the recalled total product costs given by subjects exposed to combined versus partitioned prices. Subjects who did not write down a recalled total cost (i.e., did not answer the question or wrote down the base price and surcharge but did not provide a total cost, e.g., "$69.95 plus $12.95") were dropped from this analysis. The results support H_2. Subjects exposed to partitioned prices recalled significantly lower total product costs ($78.27, n = 106) than subjects exposed to combined prices ($83.90, n = 77; r = .18, $t_{181} = 6.39$, $p<.0001$), based on a one-tailed t-test.

Classifying Processing Strategies for Partitioned Prices. We also used subjects' answers to the recalled price question to infer how frequently consumers exposed to partitioned prices used each of the three processing strategies. While we cannot observe exactly how subjects process price, we can make inferences about their processing strategies based on their answers to this question. We classified subjects as having used a mathematical calculation strategy if they wrote down a single figure within 5 percent of the actual combined price or if they made calculations near their answer (e.g., "$69.95 plus $12.95 = $82.90"), regardless of whether the calculations were correct. The range of ±5 percent for "accurate" price recall has been used in previous research on the accuracy of such recall (Dickson and Sawyer 1990). It accommodates the possibility that some consumers convert prices into approximate-magnitude estimates before storing them in semantic memory and then correctly recall the stored magnitudes. For example, $12.95 might be stored as $13. We classified subjects as using an ignoring strategy if they wrote down a single figure that was within 5 percent of the base price of the product. In all other cases, we classified subjects as using a heuristic strategy.

Based on our classification rules, it appears that all three processing strategies are well represented, and that consumers often use a strategy that does not produce the highest accuracy. We inferred that less than one-quarter of the subjects used mathematical calculation (21.9 percent), while a considerable proportion completely ignored the surcharge (23.2 percent). The most frequently used strategy appears to be a heuristic strategy (54.8 percent). These results suggest that strategies for processing partitioned prices do vary across consumers and that it is useful to examine factors that affect which strategy consumers use.

Testing the Impact of Dollar versus Percentage Surcharges ($H_{3a\text{-}c}$). We tested H_{3a} by comparing the percentage of subjects whom we classified as using a calculation strategy when the surcharge was presented in a dollar format with the percentage

who used the same strategy when the surcharge was presented in a percentage format. The results are reported in the top portion of Table 1 and support H_{3a}. The proportion of subjects whom we classified as using a calculation strategy was significantly lower when the surcharge was presented as a percentage (9.6%, n = 73) than it was when the surcharge was presented in dollars (32.9%, n = 82; r = .283, z = 3.52, p = .0002), based on a one-tailed test of two proportions.

Table 1. Impact of Partitioned-Price Presentation (Dollars Versus Percentage) on Processing Strategy, Recalled Prices, and Demand

Type of Processing Strategy	Surcharge Presented in $	Surcharge Presented in %	Effect Size	p-value
Inferred Processing Strategy				
	(n = 82)	(n = 73)	r = .283	z = 3.52 p = .0002
Calculation	32.9%	9.6%		
Heuristic	54.9%	54.8%		
Ignoring	12.2%	35.6%		
Recalled Prices				
	(n = 61)	(n = 45)	r = .109	t_{104} = 3.56 p = .0003
	$80.36	$75.43		
Choice Intentions				
	(n = 82)	(n = 73)	r = -.0098	t_{153} = -1.23 p > .5
	4.21	3.62		

The results reported in the middle portion of Table 1 show how presenting surcharges in dollar versus percentage terms affects recalled prices. These results support H_{3b}. Subjects recalled significantly higher prices for the target AT&T phone when the surcharge was presented in a dollar ($80.36, n = 61) rather than percentage format ($75.43, n = 45; r = .330, t_{104} = 3.56, p = .0003), based on a one-tailed t-test.

The results reported in the bottom portion of Table 1 show how presenting surcharges in dollar versus percentage terms affects demand. They do not support H_{3c}. While we had hypothesized greater demand among subjects exposed to a percentage surcharge, we observed no significant difference in demand among subjects exposed to a dollar surcharge for the target AT&T phone (mean purchase rating = 4.21, n = 82) and those exposed to a percentage surcharge (3.62, n = 73; r = -.0098, t_{153} = -1.23, p > .5, one-tailed).

Testing the Impact of Consumers' Relative Brand-name Affect (H_{4a-c}). We next tested H_{4a}, that those consumers exposed to partitioned prices who have comparatively low or high relative brand-name affect for a product that uses partitioned prices are less likely to use a calculation strategy than those with moderate levels of this affect. We tested for the inverted U relationship in H_{4a} by first recoding the affect scale to range from -4.5 to +4.5 to lower multicollinearity between the affect measure and the square of that measure, which we also use. We then estimated a logistic regression model in which the binary dependent variable was coded as 1 for subjects whom we classified as using a calculation strategy and 0 otherwise. The independent variables were the recoded affect scores and the square of those scores.

Since this hypothesis is only relevant for subjects exposed to partitioned prices and not for those exposed to combined prices, we only estimated the model using data from the former group. The inverse U-shaped relationship in H_{4a} is supported if the coefficient for the square of recoded affect is negative and significant. However, the coefficient for this parameter is not significantly different from zero, and therefore the results do not support H_{4a} (β = -.0253; r = -.080, χ^2 = .805, p = .18, one-tailed). In addition, the coefficient for the linear recoded affect term was not significantly different from zero (β = -.0406; r = -.044, χ^2 = .301, p = .58, two-tailed).[6]

We next tested H_{4b}, that partitioned prices will be related to a greater decrease in recalled prices for consumers with comparatively low and high levels of relative brand-name affect than for those with moderate levels of this affect. We used a regression model in which the dependent variable is recalled price and the independent variables are the recoded affect and the squared, recoded affect terms used to test H_{4a}. We estimated this model for subjects exposed to partitioned prices and combined prices separately to test whether the relationship between relative brand-name affect and recalled prices differed for these two groups. The inverted U relationship predicted in H_{4b} is supported if the parameter estimate for squared affect in the partitioned case is negative and significant and if the corresponding effect size is greater for the partitioned than the combined case.

The results supported H_{4b}. The squared, recoded affect parameter estimate had the hypothesized direction for partitioned-price subjects (β = -.179; t_{103} = 1.860, p = .032, one-tailed). The analogous estimate for combined-price subjects was not significant (β = .005; t_{74} = .120, p = .91, a two-tailed test since we have no hypothesis about the sign of this parameter for these subjects). The linear affect terms were not significantly different from zero for partitioned-price subjects (β = -.143; r = .055, t_{103} = .563, p = .57, two-tailed) or for combined-price subjects (β = -.157; r = .176, t_{74} = 1.538, p = .13, two-tailed). The parameter estimates for the combined-price subjects were significantly different from those for the partitioned-price subjects, based on a Chow test ($F_{2,179}$ = 21.55, p<.00001). Consistent with H_{4b}, the effect size implied by the squared affect term for partitioned-price subjects (r = .180) is also significantly greater than for combined-price subjects (r = -.014; z = 2.76, p = .0029, one-tailed).

Since we found support for H_{4b} but not for H_{4a}, this still leaves unanswered the question of why relative brand-name affect influences the impact of partitioned pricing on recalled prices. We offer two possible post-hoc explanations. First, moderate-affect subjects may be less likely to use an ignoring strategy than are low- and high-affect subjects, even though the former are not more likely to use a calculation strategy (since H_{4a} is not supported). Second, some subjects who use heuristics may use more effortful and accurate heuristics than others. If moderate-affect subjects use more effortful and accurate heuristics, then they may recall higher prices than low- and high-affect subjects using less accurate heuristics.

We tested the first explanation by using the same logistic regression model used to test H_{4a}, where now the binary dependent variable indicates whether or not the subject was classified as using an ignoring strategy. The results did not support this explanation, because the coefficient for the squared affect term was not significant-

ly different from zero (β = -.00088; r = .00241, χ^2 = .0009, p = .975, two-tailed). The coefficient for the linear affect term was also not significantly different from zero (β = -.120; r = .125, χ^2 = 2.423, p = .120, two-tailed).

Although we cannot observe the specific type of heuristic each subject used, we can test the second explanation by examining how recalled prices varied with affect among subjects who saw partitioned prices and were classified as using heuristics. Specifically, we regressed recalled prices on the recoded and the squared, recoded affect measure for all subjects exposed to partitioned prices and classified as using a heuristic strategy. The results, based on the coefficient for the recoded, squared affect term, provide greater support for this explanation (β = -.261; r = .329, t_{33} = 2.00, p = .053, two-tailed). We might also note that the coefficient for the linear affect term in this model is also negative and significant (β = -.857; r = .400, t_{33} = 2.504, p = .017, two-tailed). Together, these results suggest that relatively high-affect subjects who use heuristics have lower recalled prices than other subjects using heuristics.

We next tested H_{4c}, that brand name affect moderates the influence of partitioned prices on demand. This test compares a regression model for subjects who saw a partitioned price with a regression model for those who saw a combined price. Each model regressed subjects' choice intent on brand affect. H_{4c} is supported if the parameter estimate for affect from partitioned-price subjects is significantly greater than the corresponding estimate from combined-price subjects. Note that although we did not formally hypothesize a relationship between brand name affect and the demand measure, logically we expect them to be positively related, and therefore use one-tailed tests for the affect parameters.

The results support H_{4c}. The parameter estimate for affect from the partitioned-price subjects (β = .483; t_{153} = 6.993, p<.0001, one-tailed) is significantly greater than the estimate from combined-price subjects (β = .231; t_{76} = 2.194, p = .015, one-tailed) in a Chow test ($F_{1,231}$ = 4.28, p = .040).[7] The effect size from partitioned-price subjects (r = .492) is also significantly greater than that from combined-price subjects (r = .244; z = 3.02, p = .0013, one-tailed).[8]

Discussion and Implications

The results of our experiments suggest that partitioned prices do tend to increase consumers' product demand compared with all-inclusive, combined prices. Our analysis also suggests that consumers use different approaches to process partitioned prices, so that the amount of weight the surcharge receives in determining recalled prices and influencing demand varies across consumers. These results are also consistent with our theoretical framework, which proposes that one approach consumers use to select a method for processing partitioned prices is to make tradeoffs between the benefits of higher accuracy and the costs of more time and cognitive effort, although we stress here that we have not tested formally for these tradeoffs. Because consumers do not always fully and accurately process information about surcharges, partitioned prices tend to decrease consumers' recalled prices in the aggregate.

We found that the strategy that we inferred consumers chose to process partitioned prices is influenced by whether the surcharge is presented in dollars or as a percentage of the base price. We also found that the increase in demand due to partitioned pricing in a paired-choice situation increases with consumers' a priori likelihood of purchasing the brand, as measured by their relative affect for one brand name compared with the other in the choice set. Although not part of a hypothesis, an ex-post investigation suggests that this occurs because the prices recalled by consumers who use a heuristic strategy has an inverted U-shaped relationship with relative brand-name affect.

Overall, the results suggest that partitioned-pricing strategies can be effective in increasing demand for a product. Next, we describe some limitations of our research, and then we discuss the implications of our findings for consumer behavior theory, for marketers, and for public policy makers.

Limitations

In order to examine how partitioned prices affect demand, the auction experiment used a task that had real financial consequences for the subjects. However, in examining how consumers process partitioned prices and in determining the factors that moderate partitioned prices' effect on recalled prices, the telephone experiment used hypothetical scenarios that did not require consumers to make an actual purchase. Because subjects may behave differently when making actual purchases than when making hypothetical choices, we recommend that future research in this area require subjects to make actual purchases and provide subjects with economic incentives to make good decisions. We note, however, that studies of other price-processing biases have used hypothetical decisions. Consider, for example, Alba et al. (1994) on processing frequency versus magnitude information on price comparisons. Other biases of this type were first identified with hypothetical decisions and the results later verified with data from actual purchases. This includes latitude of price acceptance (Monroe 1971; Kalyanaram and Little 1994).

The surcharges we used in our experiments, which varied from 15 percent to 18.5 percent of the base price, were chosen to be well within the typical range for such surcharges. This was desirable since our primary aim was to examine the impact of partitioned-price strategies that are typically found in actual practice. However, it would be of considerable practical and theoretical interest for future research to examine how consumers react to surcharges that are much smaller or much larger. The reactions may differ from those found here. Furthermore, consumers may not notice changes in surcharges until the changes exceed the threshold of a "just noticeable difference" (Monroe 1979, pp. 42-3), in a manner similar to effects that have been found for price changes that either fall within or outside of consumers' latitude of price acceptance (Monroe 1971; Kalyanaram and Little 1994).

In the telephone experiment, we measured recalled prices by asking subjects to recall the total cost of the product in dollars. While past studies have also asked subjects to recall specific prices of products (Dickson and Sawyer 1990), there is evidence that consumers do not always encode prices as specific dollar amounts and that therefore other types of recall measures should also be employed. For example, Mazumdar and Monroe (1990) found that consumers' processing goals (i.e., remembering the prices of brands versus choosing a brand) affected whether they could accurately recall specific prices or could only rank brands by price. In general, research has suggested that the probability that an item will be recalled accurately from memory depends on the similarity between how the information was originally encoded in memory and the measure used to elicit recall (Tulving and Thompson 1973).

Recall measures such as those employed in this study are typically used in situations in which the researcher assumes that people remember having been exposed to the information that they are asked to recall. However, other measures may be more appropriate for situations in which people may be affected by, but cannot specifically remember, exposure to information. Tulving (1983, 1993) discusses some alternative measures. In the partitioned-pricing context, it is possible that consumers may be influenced by partitioned prices without being able to recall any particular total dollar price for the product. Therefore, future studies should consider using multiple measures to determine how partitioned-price information is encoded and stored in memory.

The telephone experiment, used to study H_{4a}, H_{4b}, and H_{4c} regarding the influence of relative brand-name affect, asked subjects to choose between two competing alternatives. The impact of brand name affect may be different when consumers evaluate a single alternative. In such situations, consumers may show more willingness to process information even when brand affect is low, since no higher-affect alternatives compete for their attention.

We have used samples consisting of fairly young, well-educated undergraduate and graduate students. Reactions to partitioned pricing may depend on factors such as age or education, and therefore the proportion of consumers using each of the three methods of processing partitioned prices in our experiments is not necessarily representative of the population as a whole. Ideally, future studies could involve a greater cross-section of respondent types and additional purchase situations. For example, one could conduct split-sample, direct mail experiments in which some

catalogs use combined prices while others use partitioned prices, or split cable television advertisements with the same manipulation.

Implications for Marketing Theory

Our finding that partitioned pricing can increase demand runs counter to classical economic theory, which predicts that partitioned pricing will have no impact on demand. A principle of the classical theory is that consumers' preferences will be independent of the external description used to represent choices. This is termed descriptive invariance.

Our findings also add to a body of evidence that suggests that consumers do not always completely and accurately process price information (Dickson and Sawyer 1990). We provide further support for the notion that consumers make cost-benefit tradeoffs when processing price information. Stiving and Winer (1997) suggest that it may be rational for consumers not to process the pennies (right-most) digit of prices if it is cognitively costly to do so and unlikely to lead to a mistake. Similarly, consumers may not be irrational when they underweight the surcharges in partitioned prices. Consumers may be making a rational decision that weighs the chances of making an incorrect decision against the cost of fully processing partitioned prices.

Finally, this research adds to a growing literature on behavioral aspects of pricing. While early pricing research focused on demonstrating that a particular consumer price response exists, this stream uses behavioral theories to understand why consumers respond in a given manner. In this paper, we demonstrate how consumers react to partitioned prices and use a cost-benefit framework to identify factors that help explain why they react in these ways. Other theories may identify additional factors that influence how consumers react to partitioned prices. For example, research on familiarity and learning suggests that in a choice context, consumers who are moderately familiar with the product may be better at learning product-related information than low- or high-familiarity consumers (Johnson and Russo 1984). This may suggest that moderately familiar consumers have more accurate price recall than other consumers. However, other research has found that moderately familiar consumers are less confident about using price and brand name than about using other functional product attributes as compared to high- or low-familiarity consumers (Park and Lessig 1981). We hope that future research will further examine the cognitive processes consumers use to process partitioned prices and how the process used affects the storage and retrieval of price- and product-related thoughts in memory.

Implications for Marketing Practice

The results of our experiments suggest that partitioned pricing can increase demand, which helps explain why partitioned pricing is so prevalent in today's marketplace. Although the effect sizes for increased demand observed in the experiments were relatively small, even small increases can create a meaningful increase in profits because the cost to the firm of replacing combined pricing with partitioned pricing is usually very low.

Marketers should realize, however, that partitioned pricing is related not only to higher demand but also to lower recalled prices. Thus, partitioned pricing may not

be effective when marketers desire consumers to recall high prices that reinforce a target market positioning of high quality in a category where price/quality relationships operate. For example, many furniture stores charge separately for shipping, but more expensive stores often include shipping in their prices.

Our results raise interesting questions regarding how marketers can design optimal partitioned-pricing strategies. For example, the impact of partitioned pricing on recalled prices and demand depends partly on the proportion of consumers who use a heuristic or ignoring strategy instead of a calculation strategy to process partitioned prices. These proportions may depend on the size of the surcharge relative to the base price, as well as on the absolute size of the surcharge, since consumers become more motivated to employ a higher-accuracy strategy as the surcharge increases in relative and absolute terms. This presents marketers with an interesting tradeoff in setting the size of the surcharge relative to the base price. A small surcharge may motivate many consumers to use a heuristic or ignoring strategy, but may at most decrease recalled prices only slightly, since the surcharge is small. Alternatively, a large surcharge may motivate more consumers to use a calculation strategy, but will have a bigger impact on the recalled prices and demand of those moderate- to high-affect consumers who do still use a heuristic or ignoring strategy. This tradeoff suggests that there may exist an optimal level of surcharge that maximizes firm profits. Identifying the factors that affect this tradeoff and quantifying the optimal surcharge are areas for future research on partitioned prices. However, such research will need to investigate a larger range of surcharge sizes (as a percentage of the base price) than the range used in this paper.

Consumers' perceptions of a firm's fairness and honesty may also be influenced by the size of the surcharge. Small surcharges may be viewed as fair while large ones are not. Furthermore, perceived fairness may depend on the stated purpose of the surcharge, just as the perceived fairness of price increases depends on the purpose of the increase (Kahneman, Knetsch, and Thaler 1986). For example, consumers may perceive transportation or state tax surcharges on a new automobile as more fair than a surcharge for "dealer preparation." Examining how different partitioned-price strategies affect fairness perceptions is another area for future research.

Implications for Public Policy Makers

Partitioned pricing also presents a challenge for consumers and public policy makers. We discussed earlier that partitioned pricing can become unethical when firms attempt to hide the surcharge, such as by using small type size or stating surcharges where consumers are unlikely to notice them. More research should be carried out on how presentation affects the accuracy with which consumers process partitioned prices. Such research would help identify cases in which only a low proportion of consumers are aware of the partitioned price and lead to policy guidelines for the ethical use of partitioned pricing. The guidelines that emerge might be similar to those in advertising, where advertisements that mislead a considerable proportion of consumers can be legally challenged by government agencies or competitors. Policy makers may also want to formulate methods of educating consumers to pay more attention to surcharges, much as unit-pricing labels help educate consumers about actual product costs.

Notes

1. The partitioned prices we examine are distinct from price discrimination strategies that also include two different kinds of prices. In two-part price discrimination strategies, consumers pay a set entry fee and then a separate per-use charge each time they use the product or service. By contrast, in the partitioned pricing we examine here, paying the two prices gives the consumer ownership. Nor is partitioned pricing the same as product bundling, in which two or more distinct products or services are sold together (Yadav and Monroe 1993). In the partitioned-pricing strategies we examine, the price of a single product or service is divided into two mandatory components. The strategy of partitioned pricing is also distinct from efforts to change the temporal frame consumers use to process prices, as when consumers are urged to break down the loss from a relatively large total cost into many smaller losses, each of only "pennies per day" (Gourville 1998).

2. We note here that some firms may also use partitioned prices for objectives other than increasing demand. For instance, nonrefundable shipping and handling charges may be used to discourage consumers from returning catalog merchandise (Hess, Chu, and Gerstner 1996).

3. Other heuristics are also likely to lead to lower recalled prices in this context. For example, Lynch and Srull (1982) found that consumers often devote less processing effort to less important attributes. If consumers feel that surcharges are less important than base prices, they may underestimate total product cost by underweighting the surcharge. Furthermore, consumers often give more weight to information regarding extreme attributes—those attributes that make one product very different from another—than to information regarding similarities to other products (Anderson 1971; Lynch 1979). Since in practice the base prices of products tend to vary more than do surcharges such as shipping and handling, consumers may give less weight to a dollar of surcharge than to a dollar of base price.

4. Buyer's premiums are used both in open English auctions, in which bidders raise each other's bids, and in auctions in which each bidder submits a sealed bid. McAfee and McMillan (1987) discuss these auctions.

5. We used different warranty periods and prices for the Sony and AT&T phones to differentiate the products, so subjects would not conclude that the study focused on brand preference for products with identical attributes.

6. In the preceding analysis, we used a (binary) logistic regression model to test whether the recoded affect and affect-squared terms were associated with whether a subject used a calculation strategy versus either a heuristic or ignoring strategy. We did this because our interest was in whether they used the higher-effort calculation strategy or one of the lower-effort strategies. An alternative approach is to use a multinomial logit model to examine the relation-

ship between the affect terms and the subject's choice among all three strategies. We also estimated this model and did not find a significant relationship between the linear ($p = .1743$) or quadratic ($p = .6820$) recoded affect terms and choice of strategy.

7. These results from H_{4c} establish that the relationship between relative brand-name affect and demand when subjects are exposed to partitioned prices is different from the relationship when they are exposed to combined prices. Note that had we simply compared the demand for the target phone among partitioned-price subjects with the demand among combined-price subjects (as we did in H_1 in the auction experiment), we would have concluded that partitioned pricing does not affect demand. Specifically, if we aggregate across affect levels we find that subjects exposed to partitioned prices have higher average demand (3.93, $n = 155$) than subjects exposed to combined prices (3.71, $n = 78$; $r = .0362$, $t_{231} = .55$, $p = .290$), based on a one-tailed t-test. However, this difference is not statistically significant. Thus, although we find that partitioned prices increase demand for relatively high-affect consumers, we do not find a significant aggregate effect. Note, too, that the issue of relative brand-name affect is not relevant to the auction experiment, since that experiment uses a single target product (i.e., money), which is not offered under different brand names.

8. H_{4c} implies that demand among partitioned-price subjects will be no lower than demand among combined-price subjects at low levels of relative brand affect, and that the demand increase due to partitioned pricing increases with this affect. Here, we note that in the two regressions just described, the predicted values of affect are slightly lower for partitioned-price subjects when this affect is very low. However, these differences are never statistically significant, while the increase in demand from partitioned pricing is statistically significant. We determined this by comparing the explanatory power of these two regressions if modeled as a single regression with that of a model in which demand for the two groups is constrained to be the same at the lowest affect score (using a nested F-test: $F_{1,229} = 1.61$; $p = .206$).

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