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HOW TO QUOTE A PRICE -- $0.50 EACH OR 2 FOR $1.00?

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HOW TO QUOTE A PRICE? $0.50 EACH OR 2 FOR $1.00?

Abstract

Price is usually quoted as number of dollars per quantity unit. Some sellers, however, advertise price using "N for price" formats rather than a per-unit format or a "price illusion" format that states a price for a quantity less than the minimum purchase required. This paper reports exploratory experimental research to determine the likely effect of these practices on buying behavior.

When a seller is ready to advertise a price for his product, he must select the quantity for which to quote the price. While many sellers quote price per unit and allow customers to buy any quantity, others advertise multiple units for a price or require purchases of more than a single unit. Tables 1 and 2 illustrate the latter two strategies. (The price quotations were taken from advertisements in student and local newspapers.)

The prices of Table 1 were quoted for two or three units (we will refer to this as the "N for price" format). Despite this, buyers were allowed to purchase less than the quoted quantities for the prorated prices shown in the third column of the Table. For the prices quoted in Table 2, however, consumers were required to buy more than the quoted quantity (twice as much) at prorated prices (we will refer to this as the "price illusion" format).

Why did the sellers prefer to quote price in the format of column two and not in the straightforward way shown in column three of the Tables? Why quote price as "2 for $1.00" and allow purchases of one for $0.50 instead of just quoting "$0.50 each"? Why quote price as "$249 one way based on a roundtrip purchase" and not "$498 roundtrip"? Do consumers respond differently to the different price quote formats even though they are economically equivalent (i.e., if they have the same unit prices and the same purchase requirements)? The exploratory experimental research described below was designed to yield insight, but first let's consider a few theories that lead to testable hypothesis.

II. "N for Price" and Bundling Behavior

One possible explanation for the "N-for Price" practices of Table 1 draws on the economic theory of bundling. Adams and Yellen (1976) studied two types of bundling practices: Pure Bundling and Mixed Bundling. Pure bundling occurs when customers are presented with all-or-nothing offers in which they cannot buy less

than the quoted quantity at a prorated price (i.e., they cannot break the bundle). If some customers are allowed to break the bundle, the practice is called mixed bundling. Mixed bundling may induce "quantity insensitive" customers to bundle without discouraging quantity-sensitive customers from buying smaller quantities.

Supermarkets that use N-for price quotes allow bundle breaking, and this resembles mixed bundling. However, some customers might perceive the offer as pure bundling. These customers may decide to bundle (call them bundlers) or not to buy the product at all. Even customers who are not sure about the store policy might buy in bundles of N to avoid potential inconveniences at the checkout desk. Customers who are well-informed about the store policy are more likely to break bundles (call them nonbundlers). Under mixed bundling we would expect the following bundling behavior:

H_1: The distribution of bundlers, nonbundlers and nonbuyers under the N for price formats will be significantly different than the distribution under the per-unit formats as follows:

(a) The percentage of bundlers will be larger under N for price (because some buyers perceive the offer as pure bundling and buy in bundles of N).

(b) The percentage of nonbuyers will be larger under N-for price (because some buyers perceive the offer as pure bundling but refuse to buy in bundles of N).

(c) The percentage of nonbundlers will be significantly greater than zero under N for price (because some buyers do not perceive the offer as pure bundling and break the bundle).

III. The Effects of N for Price on Perception and Buying

Bundling Effects. According to the mixed bundling theory N for price will be perceived as inferior to an equivalent prorated per-unit quote because some consumers may perceive the former quote as pure bundling. The predicted effect on buying, however, is ambiguous. If the number of customers who decide not to buy the product because they perceive N for price as pure bundling

is too large, sales could decline.[1] On the other hand, if the customers who perceive N for price as pure bundling are not quantity sensitive, the mixed bundling practice could result in higher sales.

Signaling Effects. Unambiguous effects on perception and sales are predicted by a different theory; N for price could be perceived by some consumers as a signal to a good deal. Consumers believe that they pay a lower per-unit price when they buy larger quantities (Granger and Billson (1972)). This is not surprising because quantity discounts are common (Dolan (1987), Gerstner and Hess (1987)). Under this theory, a larger volume offer such as N for price can serve as a signal for a low price to customers who do not compute price per unit. Is N for price perceived to be more attractive compared to per-unit quotes because consumers believe that under the former they pay a lower unit price?

Unfortunately, unequivocal answers to these questions might be hard to obtain because it is hard to separate the bundling and the signaling effects. Both bundling and signaling might be at work at the same time and affect different customers in different ways. Keeping this in mind, we will test the following hypothesis:

H_2: Compared to the straightforward per-unit price quotes, N for price quotes are perceived to be more attractive and therefore they help stimulate sales.

IV. The Affect of Price Illusion Formats on Perception and Buying

In the price quotes of Table 2, customers were required to buy twice as much as the quoted quantity. Why quote price for a quantity that is smaller than the quantity required for purchase?

Two explanations come to mind. First, by reducing the quoted quantities, the price figures that appear in the ads are also reduced, and this could help attract consumer attention. Second, because of the lower price figures, some

[1]To the extent that nonbuyers have no experience with a product brand and thus cannot become brand loyal, N for price actually may have detrimental effects on sales over the longer term.

consumers might underestimate the full cost of the offers despite the fact that the mental effort required to figure it out is minimal. The practice could be related to the phenomenon of odd-even pricing (for example, quoting a price of $9.99 instead of $10.00). By quoting the odd price ($9.99), a seller hopes to create an illusion that his price is substantially lower than the even price ($10.00), perhaps because consumers pay more attention to dollar figures than to cents.[2] The hypothesis that follows is:

H_3: Quoting price for a quantity less than the minimum purchase required (at a prorated price) can stimulate sales.

To test the hypotheses above, we designed the following experiments.

V. Method

The newspaper ads containing the original quotes in the second column of Tables 1 and 2 were clipped and copied. We created a second version of each N for price ad by replacing the original N for price quote with the equivalent per-unit quote shown in the third column of Table 1 (obtained by dividing the bundled quote by N). For the original price illusion formats, the modified ads included only the actual minimum purchase required by the advertiser shown in the third column of Table 2 (in all three cases this was twice the dollar amount quoted in the original ad). The original and altered ads were used to create two different booklets, each containing six ads (one for each product). The ads were assigned to the booklets as shown in Table 3.

On the same page on which the ad was reproduced, respondents were asked to rate each offer on a seven-point scale with "1 = poor value" and "7 = excellent buy" and to indicate purchase intentions on a five-point scale with "1 = definitely not," "2 = probably not," "3 = might or might not," "4 = probably" and "5 = definitely."

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[2] Results on the effect of odd-even pricing on consumer behavior, however, are mixed (see, for example, Schindler and Wiman (1987), and Blattberg and Wisniewski (1988)).

The booklets were randomly distributed to small classes of economics and business undergraduates during summer school. Class size varied between 15 and 35 students. Altogether 148 students participated.[3]

VI. Testing the N for Price Hypotheses

Bundling Behavior. For each product, the number of units students indicated they would purchase was used to categorize the respondent as a bundler, a nonbundler or a nonbuyer. Bundlers were those respondents whose purchases were either exactly N as in the bundled quote or multiples of N. For both the pineapple and the peanut ads, bundlers indicated they would buy two units or a multiple of two. For the paper towels, bundlers indicated they would buy three units or multiples thereof. Nonbundlers were respondents who indicated a purchase intention greater than "0" that was not N or a multiple thereof. Nonbuyers were students who indicated they would not purchase any of the product at the prices advertised.

To compare differences among bundlers as well as differences among nonbuyers for the two price quotes, a between group t test of proportions was used. To determine if the proportion of nonbundlers exposed to the "N for price" quote differed from zero, a single sample t test was used. Finally, a χ^2 test of goodness of fit was used to determine whether the distributions of bundlers, nonbundlers and nonbuyers under the N for price formats were significantly different than distributions under the per-unit formats. The results are displayed in Table 4.

Hypothesis 1(a), that we would observe more bundling for the N for price condition, was strongly supported for both paper towels and peanuts but not for the pineapple offer. For paper towels, six times as many respondents were bundlers for the "3 for $2.00" condition as for the unbundled condition; for peanuts, over four times as many respondents bundled for the "2 for $5.00"

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[3]Selecting students as subjects may be limiting because they do not necessarily represent the target markets for the products used to test the hypotheses above. Using students, however, might be a conservative way to test Hypothesis H_1 and H_2 because students have lower incomes relative to those of typical grocery store shoppers, and therefore they are less likely to purchase multiple units.

condition as for the unbundled condition. There was no difference in the amount of bundling as a function of price quote in response to the pineapple ad.

Hypothesis 1(b,) that more nonbuyers will exist when the price quote is in bundle format, was supported for the peanut ad and marginally supported for paper towels. For pineapple, there was no difference in the proportion of nonbuyers as a function of the price quote condition.

Hypothesis 1(c), that some respondents would unbundle even when exposed to a bundled price quote, was supported for all three products. That is, a significant number of students who read an N for price ad broke the bundle by buying a non-N quantity of the product advertised. Finally, the high value of the χ^2 statistics for paper towels and peanuts confirms that the N for price format is likely to change buying patterns.

Perception and Buying. For each product, the mean amount of students indicating they would purchase and the mean rating of the offer's value were computed. To see whether N for price signals a more attractive price, we compared the average amount of the products bought under each condition and the mean ratings of each offer's value using a between group t test. As shown in Table 5, only for paper towels was there significant evidence to support the idea that N for price signals a quantity discount or creates the impression of a lower price. For pineapple and peanuts, price quote format produced no significant differences in the amount sold or in the average value ratings for any product.

VII. Testing for a Price Illusion Effect

The test results for the three products used to study the effectiveness of quoting price for a quantity less than the minimum purchase required are displayed in Table 6. Students who indicated they "definitely would recommend" the purchase were classified as definite buyers, while those indicating they "probably would recommend" the purchase were classified as possible buyers.

A between group t test of proportions was used to test for differences as functions of price quote format. For each price quote format, all respondents' ratings of the offer were used to compute the mean rating of its value.

The only product that registered a difference in purchase recommendations and value was the Caribbean vacation offer. Twice as many respondents were definite or possible buyers when the vacation price was expressed "per person, double occupancy" compared to "per room, double occupancy." The former quote also produced a higher value rating. Price quote format had no effect on responses to either the Paris flight or the mattress set ads.

VIII. Discussion

Our research findings indicate that quoting N for price rather than simple unit pricing can produce more bundlers as well as nonbuyers, presumably because customers may be unaware that they can break the bundle or because they want to avoid inconveniences at the checkout desk.[4] This result did not hold for pineapple, which was the least expensive item. It is evident that for pineapple, the respondents bundled even under per-unit pricing. Future research might determine whether this bundling phenomenon is generally true for other inexpensive items (50 cents per unit and below).

N-for price resulted in lower sales for pineapple and higher sales for paper towels and peanuts; however, a significant difference in sales between the price quote format existed only for paper towels. Recent nonexperimental research with supermarket scanner data found a positive N for price effect on sales for margarine and bath tissues but not for tuna fish (Blattberg and Wisniewski (1988)). It seems that the N for price effect is product specific. We plan to conduct quasi experimental research with store data to determine when a positive N-for price effect on sales is likely to exist.

Our data are less clear on the effectiveness of quoting prices for quantities smaller than the quantity required for purchase. Quoting airfares one way based on roundtrip purchase and quoting prices of mattresses per piece while

[4]This phenomenon was observed by Blattberg and Wisniewski (1987), who studied supermarket scanning data.

requiring the purchase of a set did not generate better responses than quoting prices for the quantity required for purchase. For the Caribbean vacation, however, quoting price "per person double occupancy" generated a significantly better response than quoting price "per room, double occupancy."

Why we obtained such a dramatic difference for the vacation offer is unclear. The relatively high price of the per-room ad may have intimidated our student sample. It would be interesting to investigate responses to the per-room vs. per-person format for a less expensive rate.

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Table 1
N-for Price Formats

Product	Quoted Quantity	Minimum Purchase
Canned pineapple	2 for $1.00	$0.50 each
Paper towels	3 for $2.00	$0.67 each
Roasted peanuts	2 for $5.00	$2.50 each

Table 2
Price Illusion Formats

Flight to Paris	$249 one way	$498 roundtrip
Mattress	$65.00 each	$130 set
Caribbean vacation	$444 per person double occupancy	$888 per room double occupancy

Table 3
Assignment of Price Quote Formats to Booklets

Product	Booklet Type 1	Booklet Type 2
Caribbean vacation	$444 per person double occupancy	$888 per room double occupancy
Canned pineapple	$0.50 each	2 for $1.00
Mattress	$130 set	$65.00 each
Paper towels	3 for $2.00	$0.67 each
Flight to Paris	$498 roundtrip	$249 one way
Roasted peanuts	$2.50 each	2 for $5.00

Table 4
Bundling Behavior

Product	Price Quote Format		t Test Results	
Pineapple	**2 for $1.00**	**$0.50 each**	**t value**	**p value**
Bundlers	77.0%	72.2%	0.67	0.50
Nonbundlers	9.5%*	18.1%	----	----
Nonbuyers	13.5%	9.7%	0.72	0.47
$\chi^2(2) = 1.96$				
Sample se	74	72		
Paper towels	**3 for $2.00**	**$0.67 each**		
Bundlers	50.7%	8.2%	5.63	0.00
Nonbundlers	20.5%*	75.4%	----	----
Nonbuyers	28.8%	16.4%	1.79	0.07
$\chi^2(2) = 196$				
Sample size	73	73		
Peanuts	**2 for $5.00**	**$2.50 each**		
Bundlers	28.4%	6.8%	3.43	0.00
Nonbundlers	27.0%*	64.4%	----	----
Nonbuyers	44.6%	28.8%	2.00	0.05
$\chi^2(2) = 73.6$				
Sample size	74	73		

* The proportion of nonbundlers is significantly different than zero.

Table 5
Perception and Buying

Product	Price Quote Format		t Test Results	
Pineapple	**2 for $1.00**	**$0.50 each**	**t value**	**p value**
Average buy	2.15 pks	2.29 pks	0.58	0.56
Average rating	4.92	4.76	0.75	0.46
Sample size	74	72		
Paper towels	**3 for $2.00**	**$0.67 each**		
Average buy	2.5*	1.6	1.84	0.06
Average rating	4.6	4.9	1.30	0.20
Sample size	73	73		
Peanuts	**2 for $5.00**	**$2.50 each**		
Average buy	0.9	0.8	0.85	0.40
Average rating	4.0	4.2	0.76	0.45
Sample size	74	73		

* The average is significantly different than the average under the per unit quote.

Table 6
Response to Price Illusion

Product	Price Quote Format		t Test Results	
Paris flight	**$249 each way roundtrip purchase required**	**$498 Roundtrip**	**t value**	**p value**
Definite buyers	13.5%	18.9%	0.89	0.95
Possible buyers	40.5%	31.1%	1.19	0.39
Average rating	4.81	4.89	0.3	0.76
Sample size	74	74		
Mattress	**$72 each piece sold in set**	**$144 set**		
Definite buyers	2.8%	2.7%	0.04	0.96
Possible buyers	27.8%	27.0%	0.11	0.91
Average rating	4.32	4.18	0.63	0.53
Sample size	72	74		
Caribbean vacation	**$444 per person double occupancy**	**$888 per room double occupancy**		
Definite buyers	6.8%	0.0%	2.28	0.02
Possible buyers	36.5%	20.3%	2.19	0.03
Average rating	4.69	4.19	2.14	0.03
Sample size	74	74		