Increased Consumer Sales Response Though Use of 99-Ending Prices

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Through the cooperation of a direct-mail women's clothing retailer, we were able to conduct a well-controlled experiment testing the sales effect of using retail prices that end in the digits 99 rather than 00 (e g , $29.99 rather than $30 00) The results indicated that the use of 99 endings led to increased consumer purchasing This finding demonstrates the importance of the manager's decision concerning a price's rightmost digits

INTRODUCTION

Retail price-setters tend to choose the rightmost digits, or *ending*, of a price so that the price falls just below a round number (i.e., below a number ending in one or more zeros). Thus, we often see price endings such as 49 (e.g., $2.49), 95 (e.g., $129.95), and 99 (e.g., $39.99). This tendency has been documented by retail price surveys (Kreul, 1982; Schindler and Kirby, 1995; Twedt, 1965) and can be traced back at least to the middle of the last century (Hower, 1943, pp., 120-121).

This practice, referred to variously as "odd pricing" (Hawkins, 1954; Knauth, 1949), "psychological pricing" (Mason and Mayer, 1990, p. 442), and "just-below-the-round-figure pricing" (Gabor and Granger, 1964), has been studied by academic researchers at least as far back as the 1930s (Bader and Weinland, 1932). However, despite this long history of academic attention, there is remarkably little knowledge concerning whether or not the practice has any actual effect on sales (Holloway, 1973).

In this paper, we focus on testing whether there is a sales effect of one particular just-below ending, the 99 price ending. We first present two commonly proposed rationales for expecting a sales advantage of 99 endings and review past studies that have tested for such

a sales effect. Then we report the results of new sales test, a field experiment in cooperation with a direct-mail woman's clothing retailer, and discuss the implications of these results.

Two Commonly Proposed Theoretical Mechanisms of a 99-Ending Effect

One often proposed rationale for expecting a sales advantage of 99 endings could be referred to as the *underestimation mechanism* (Alpert, 1971, p. 112; Brenner and Brenner, 1982; Georgoff, 1972, pp. 4-6; Lambert, 1975; Nagle and Holden, 1995, pp. 300-301; Schindler and Wiman, 1989; Simon, 1989, p. 183). Because multi-digit numbers are processed from left to right (Hinrichs, Berie and Moselle, 1982; Poltrock and Schwartz, 1984), a tendency of consumers to minimize information-processing effort may lead them to ignore or pay less attention to a price's rightmost digits.

Such inattention to the rightmost digits could lead the consumer to regard a 99-ending price as substantially lower than it actually is because the rightmost digits that are ignored may represent a considerable amount of money. For example, completely ignoring the three rightmost digits of $29.99 would be equivalent to ignoring $9.99 of the price, a "potential underestimation" of 33 percent.[1] Such complete inattention to the three rightmost digits would not have a similar effect on a 00-ending price (e.g., $30.00), because ignoring zeros is equivalent to ignoring nothing. Thus, a tendency to ignore rightmost digits could lead the consumer to show a greater sales response to a 99-ending price than to the 00-ending price one penny higher.

A second commonly proposed rationale for expecting a sales advantage of 99 endings could be referred to as the *association mechanism*. Through a process of "incidental" or low-involvement learning (Postman, 1964; Hawkins and Hoch, 1992), consumers may come to associate a particular price ending with characteristics of the marketing context in which that price ending is often used.

It has often been proposed that the 99 price ending carries the connotations of a sale or discount price (Berman and Evans, 1992, p. 440; Kotler, 1991, p. 489; Raphel, 1968), and this possibility has been supported empirically in laboratory research (Quigley and Notarantonio, 1992; Schindler and Kibarian, 1995). Schindler and Kirby's (1995) results suggest how these associations may have been formed. In their systematic survey of newspaper price advertising, they found that the 99 price ending occurred more frequently in ads that claimed discounts than in ads where discounts were not claimed (and the 00 price ending occurred *less* frequently in discount ads). This pattern of price-ending use creates the conditions for 99 endings to become associated in the consumer's mind with the presence of a discount and thus become more likely than 00 endings to impart the connotations of a discounted or otherwise low price.

Past Tests of a Sales Effect

Excluding anecdotal reports of price-ending effects, we were able to find only four published reports of studies that systematically tested for the presence of an effect of the 99

ending or other just-below price endings on sales. The earliest was an experiment reported by Ginzberg (1936). Conducted with the cooperation of a large mail-order retailer, the experiment involved the comparison of the sales response to two versions of the retailer's catalog. In one version, selected items were offered at $.49, $.79, $.98, $1.49, and $1.98. In the other version, these items were priced at $.50, $.80, $1.00, $1.50, and $2.00. Ginzberg reported finding sales effects that were inconsistent: some items showed greater sales when offered at the prices with just-below endings, some showed greater sales at the round-number prices, and other items showed no difference between the two pricing conditions. However, Ginzberg's one-page report did not describe these results in detail and did not provide tests of statistical significance.

Dalrymple and Haines (1970) modeled sales in the junior sportswear department of a southern California department store and included in the model a variable indicating whether or not an item's price ended in the digits 00. Most of the non-00 endings were 95 endings, but several prices ending in the digits 29, 47, 49, 75, 97 were also included. Although their estimation of the model's parameters produced a coefficient of the price ending variable that was in the direction of a sales advantage of the non-00 endings, this coefficient was not statistically significant.[2]

Georgoff (1972) carried out an in-store sales experiment in a large south Florida department store chain. For a diverse set of 11 products, Georgoff varied the prices on a weekly basis over a four-week period, alternating between 00-ending prices (e.g., $8.00) and 98-ending just-below prices (e.g., $7.98). He found no statistically significant sales difference between the two price-ending conditions.

Blattberg and Wisniewski (1987) describe a model relating price and other factors to sales of supermarket items (although their paper is unpublished, the work is described in Blattberg and Neslin, 1990, pp. 349, 367-369). This model included a variable indicating whether or not a brand's price ended in the digit 9. Estimating the model's parameters on store-level scanner data for a large supermarket chain, Blattberg and Wisniewski found that 13 of 21 brands tested showed substantially higher sales when their prices ended in the digit 9. However, because of the nonexperimental nature of the data, these results cannot be considered conclusive. Particularly considering that most supermarket items are priced with 9 endings (Twedt, 1965), it is difficult to be sure that Blattberg and Wisniewski's model captured all of the differences that may distinguish the minority of items whose prices end in digits other than 9.

Together, these studies present an inconsistent picture. Two of the studies found no statistically significant price-ending effects, and the other two studies reported price-ending effects for only some of the items tested.

The methods used in these studies no doubt contributed to their inconsistencies. The Dalrymple and Haines (1970) and the Blattberg and Wisniewski (1987) studies relied on correlational rather than experimental methods. Georgoff's (1972) in-store experiment may have been contaminated by regular customers noticing the weekly price changes. Ginzberg's (1936) study tested several different price endings and apparently confounded price ending with product type. None of these published studies provides a detailed report of a well-controlled test of the sales effect of a particular just-below price ending.

THE PRESENT STUDY

This study is an attempt to provide such a well-controlled sales test for the 99 price ending. In order to achieve a high degree of control in a large sales experiment, we sought to conduct this test using the merchandise of a retailer who communicates with customers exclusively through direct mail. The retailer whose cooperation we were able to obtain was a direct-mail marketer of women's clothing.

The 99-ending test was carried out through the use of two versions of a 169-item semiannual clearance catalog. In the 99-ending version of the catalog, each price was one penny lower than in the 00-ending version. For a large proportion of the 169 prices (75 prices, or 44 percent), completely ignoring the rightmost 9 digits in a 99-ending catalog would result in a potential underestimation of more than 5 percent of the price. In fact, for 25 of the 169 prices, the 99-ending form involved a potential underestimation of 20 percent or more; and for the ten items whose 99-ending price was $19.99, the potential underestimation was 50 percent. Thus, the potential existed for the underestimation mechanism to cause greater sales for the 99-ending version of the catalog.

In addition, the clearance catalog would be expected to appeal to consumers attracted by low prices, so an association in the consumer's mind between the 99 ending and discounts or low price could be expected to enhance sales. Thus, the potential existed for the association mechanism to cause greater sales for the 99-ending version of the catalog.

Because both of the proposed theoretical mechanisms of a 99-ending sales effect could act to cause such an effect in this experimental situation, we hypothesize that the 99-ending catalog will generate greater sales than the otherwise identical 00-ending catalog. This sales difference could derive from one or both of two sources, (1) the number of purchasers and (2) the amount each purchaser spends:

H1a: *The catalog with prices ending in the digits 99 will generate a greater number of purchasers than will the otherwise identical catalog with prices (one cent higher) ending in the digits 00.*

H1b: *The catalog with prices ending in the digits 99 will result in purchasers spending larger amounts than are spent by the purchasers from the otherwise identical catalog with prices (one cent higher) ending in the digits 00.*

The cooperating retailer expressed the preference that the experiment include a third condition in order to provide a point of comparison to past versions of this catalog. Although the retailer's various catalogs used a wide variety of price endings for both discounted and full-price items, in this particular clearance catalog, the 88 ending had typically predominated. Thus, the third experimental condition used the 88 ending (i.e., prices 12 cents lower than those in the 00-ending condition).

Because of the lack of extensive data on the pattern of use of the 88 ending, it is not clear what is the prediction of the association mechanism regarding the effect of the 88 ending on sales. However, because a consumer tendency to ignore rightmost digits would have a

very similar effect for 88 price endings as for 99 price endings,[3] the potential exists for the underestimation mechanism to cause an 88- vs. 00-ending sales difference.

Thus, we hypothesize:

> **H2a**: *The catalog with prices ending in the digits 88 will generate a greater number of purchasers than will the otherwise identical catalog with prices (12 cents higher) ending in the digits 00.*

> **H2b**: *The catalog with prices ending in the digits 88 will result in purchasers spending larger amounts than are spent by the purchasers from the otherwise identical catalog with prices (12 cents higher) ending in the digits 00.*

To test these hypotheses, the experiment used three versions of the semiannual clearance catalog, each identical except for the price endings used. In one version, the prices ended in the digits 00. In a second version, all of the prices were one cent lower than in the 00-ending version so that they ended in the digits 99. In the third version, the prices were 12 cents lower than in the 00-ending version so that they ended in the digits 88. Each catalog was sent to a randomly chosen sample of 30,000 names on the company's mailing list. The sales response to each catalog was then tracked for a six-month period.

METHOD

Test Design

The experiment was carried out using the winter clearance catalog of a direct-mail women's clothing retailer with a national customer base of approximately 600,000. The 24-page catalog was printed in black and white and displayed prices for 169 items.

Each item's listing included a selling price and a reference price. The selling prices were always displayed with cents digits and were described by the semantic cue "now only" (e.g., "Now only $23.99"). The selling prices ranged from $7 (for a scarf) to $120 (for a suit), and the mean of the 00-ending form of the 169 selling prices was $31. The reference prices were expressed without cents digits and were described by the semantic cue "was" (e.g., "Was $40"). The mean claimed discount for an item was 49.2 percent.

Three versions of the catalog were used in the test. The three versions were identical except for the price endings used to express the selling prices. In one version, all of the selling prices ended in the digits 00 (e.g., $18.00). In a second version, all of the selling prices were one cent lower than the 00-ending prices, thus ending in the digits 99 (e.g., $17.99). In the third version, all but six[4] of the selling prices were 11 cents lower than the 99-ending prices (and 12 cents lower than the 00-ending prices), thus ending in the digits 88 (e.g., $17.88).

Catalog Distribution and Data Collection

Ninety thousand customers were selected randomly from the customer base for inclusion in this "split-run" test. Every third name on the list of selected customers received one of

the three versions of the catalog; thus 30,000 customers were assigned to each of the three experimental conditions.

The catalogs were mailed out in mid-December and sales response data were collected through mid-June of the following year. Customer orders were received by telephone or by mail. The orders that were included in the study were those orders for which the customer gave a catalog number that matched that of one of the three test catalogs. A small number of these orders included items from catalogs the customer had received in earlier mailings.

The order information that was reported to us included (1) the number of items purchased in the order and (2) the total dollar amount of the order (exclusive of shipping charges and sales tax). We were given the customer number for each order, but we were not given information on the identities of the individual items ordered.

RESULTS

The mailing of 90,000 catalogs led to 2812 customers placing one or more orders from the catalog they received, and resulted in total sales revenue of $222,545. The sales results for each of the three versions of the catalog are displayed in Table 1.

Examination of Table 1 indicates that the 99-ending version of the catalog produced 8.0 percent more sales volume than the 00-ending catalog. The 99-ending catalog generated more purchasers than did the 00-ending version of the catalog, and those who purchased from the 99-ending catalog purchased larger amounts, irrespective of whether the mean or median is used as a measure of the central tendency of their purchase amount.

Surprisingly, the 88-ending version of the catalog produced a sales volume and number of purchasers that were very close to those of the 00-ending catalog. The customers who purchased from the 88-ending catalog did appear to purchase larger amounts than those who purchased from the 00-ending catalog, but only when the median, rather than the mean, is used as a measure of the central tendency of their purchase amount.

TABLE 1

Sales Results for Each of the Three Catalog Versions

	Catalog Version		
	88-Ending	99-Ending	00-Ending
Catalogs distributed	30,000	30,000	30,000
Sales volume ($)	71,699	78,317	72,529
Number of purchasers	923	968	921
Response rate (%)	3 08	3 23	3 07
Mean purchase dollars per purchaser	77 68	80 91	78 75
	(68 02)[a]	(71 86)	(81 52)
Median purchase dollars per purchaser	57 51	59 99	50 00
	(72.76)[b]	(74 71)	(72 00)

Notes   [a]Numbers in parentheses in this row are standard deviations
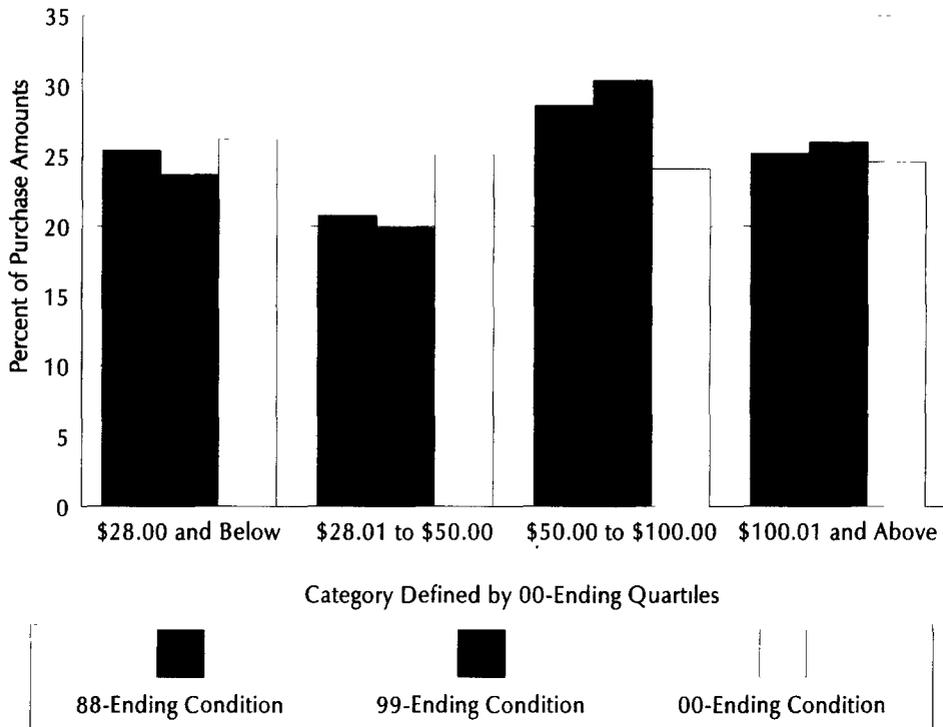   [b]Numbers in parentheses in this row are interquartile ranges

TABLE 2

Sales Results with Data from Outlying Purchasers Removed

	Total Purchasers Included	Catalog Version		
		88-Ending	99-Ending	00-Ending
All purchasers:				
Number of purchasers	2812	923	968	921
Sales volume ($)		71,699	78,317	72,529
% Difference from 00 condition		−1.1	+8 0	
10 largest purchasers removed:				
Number of purchasers	2802	922	966	914
Sales volume ($)		71,172	77,323	68,520
% Difference from 00 condition		+3 9	+12 8	
20 largest purchasers removed:				
Number of purchasers	2792	920	964	908
Sales volume ($)		70,382	76,485	65,959
% Difference from 00 condition		+6.7	+16 0	
30 largest purchasers removed:				
Number of purchasers	2782	917	959	906
Sales volume ($)		69,256	74,593	65,210
% Difference from 00 condition		+6 2	+14 4	
60 largest purchasers removed:				
Number of purchasers	2752	904	948	900
Sales volume ($)		65,097	70,851	62,264
% Difference from 00 condition		+4 5	+13 8	

This difference between the pattern of results indicated by the median and the mean led us to examine the distribution of the purchase amounts of the 2812 purchasers. This distribution showed an extremely long tail in the direction of large purchase amounts. For example, ten of the 2812 purchasers purchased more than $466 worth of merchandise from their test catalog (i.e., over six standard deviations above the mean purchase amount). Moreover, these outliers happened to be unevenly distributed among the three catalog conditions—seven of these ten large purchasers occurred in the 00-ending condition.

Table 2 shows the effects of removing the data from these ten outlying cases. The sales advantage of the 99 catalog over the 00 catalog becomes larger, and the 88 catalog now also shows a sales advantage over the 00 catalog, albeit a smaller one. Moreover, as Table 2 indicates, the pattern revealed by the removal of the ten largest outliers is not an arbitrary result of the number of outliers removed. The pattern of results remains stable even if as many as 60 of the largest outliers are removed, comprising approximately the largest two percent of the purchasers in each of the three conditions.

Figure 1 shows the distributions of purchase amounts in each of the three price-ending conditions using categories matching as closely as possible the quartiles of the purchase amounts in the 00-ending condition. This analysis indicates that the 99 price ending had little effect on the proportion of small ($28 and below) or large ($100.01 and above) purchase amounts. The greater average purchase amount for 99 endings than for 00 endings appears

Figure 1.   **Distribution of Purchase Amounts for Each Price-Ending Condition Using Categories Defined by Quartiles of 00-Ending Condition**[a]

to have been due mostly to a lower proportion of purchase amounts in the $28.01-$50 range and a greater proportion of purchase amounts in the $50.01-$100 range. Thus, the use of 99-ending prices appears to change the shape of the distribution of purchase amounts. The distribution of purchase amounts in the 88-ending condition showed a similar pattern of difference from the 00-ending distribution, only to a lesser degree.

This examination of the distribution of purchase amounts offers guidance for selecting statistical tests of the reliability of the purchase-amount differences between the three price-ending conditions. The presence of outliers (i.e., a positively skewed distribution) suggests the appropriateness of the log transform of the purchase amount data in any parametric tests (Kirk, 1982, p. 83). The presence of outliers would also suggest the use of a nonparametric test. However, given that there are differences between experimental conditions in the shape of the distributions, the appropriate nonparametric test of central tendency would have to be one that is minimally sensitive to changes in the shape of the distribution, such as the median test (Gibbons and Chakraborti, 1992, p. 206).[5]

In the following tests of the hypothesized differences in purchase amount, we use both the *t*-test on the log transformed data and the median test. We use a chi-squared test to test hypothesized differences in the number of purchasers.

Tests of Hypotheses 1a and 1b

As can be seen in Table 1, the 30,000 99-ending catalogs generated 968 purchasers. This was 47 more purchasers than were generated by the 30,000 00-ending catalogs. Although in the predicted direction, this difference was not statistically significant ($X^2 =$, 1.16, $p <$ .30). Thus, the data do not support **H1a**, that a catalog with 99-ending prices will generate more purchasers than an otherwise identical catalog with 00-ending prices.

Table 1 also shows that both the mean and median purchase amount was greater for the customers purchasing from the 99-ending catalogs than for those purchasing from the 00-ending catalogs. This finding of larger purchase amounts due to 99-ending prices is statistically significant by a *t*-test on the log-transformed purchase amounts ($t[1887] = 1.70, p <$ .05, one-tailed) and by a median test ($X^2 = 8.59, p < .005$). Thus, the data support **H1b**, that a catalog with 99-ending prices will result in purchasers spending larger amounts than are spent by purchasers from an otherwise identical catalog with 00-ending prices.[6]

Tests of Hypotheses 2a and 2b

The 30,000 88-ending catalogs generated 923 purchasers, only two more than were generated by the 30,000 00-ending catalogs. Although in the predicted direction, this difference was certainly not statistically significant ($X^2 < 1$). This indicates that the data fail to support **H2a**, that an 88-ending catalog will generate more purchasers than will an otherwise identical 00-price-ending catalog.

Although the mean purchase amount of the customers receiving the 88-ending catalogs was smaller than that of the customers receiving the 00-ending catalogs, this difference in the opposite of the predicted direction was not statistically significant (log transformed purchase amounts, $t(1842) < 1$). However, as discussed above, the difference between these two conditions reverses itself if even only ten of the largest outlying purchase amounts are removed. Further, the *median* purchase amount of those purchasing from the 88-ending catalogs was substantially higher than that of the 00-catalog customers, and this difference was statistically significant by a median test ($X^2 = 4.39, p < .05$).[7]

We conclude from this that the data offer only very limited support for **H2b**, that an 88-ending catalog will result in purchasers spending larger amounts than are spent by purchasers from an otherwise identical 00-price-ending catalog. Although the data do indicate that the 88-ending catalog generated a greater number of larger purchase amounts, the data do not indicate that this effect is large enough to overcome the variation that is likely to occur at the upper end of the purchase-amount distribution.

DISCUSSION

These results provide the first well-controlled experimental demonstration that use of the 99 price ending can cause more consumer sales than the use of the 00 price ending one cent higher. Specifically, these results indicate that the use of 99 endings can increase the amount that purchasers spend. We cannot say from these data whether or not 99 endings can also increase the likelihood that a customer will make a purchase. Nor can we make a firm conclusion from these data whether or not the 88 price ending also has a positive effect on sales.

The size of the 99-ending sales advantage found in this study—8.0%—is substantial, both theoretically and managerially. Theoretically, the size of this sales difference renders it highly likely that it is due to factors specific to the 99 and 00 price endings rather than merely reflecting a high level of price sensitivity. The sales difference between the 99- and 00-ending catalogs was produced by a minute (one-cent) difference between the levels of the two sets of prices. A one-cent difference amounts to .03 percent of the average selling price in the catalog, $31. If this market would respond to any .03 percent price decrease with an eight percent sales increase, it would suggest the highly implausible price elasticity of −267.

Managerially, an eight percent increase in sales revenue at a cost of a one-cent per item decrease in price is undeniably attractive. Indeed, the direct-mail retailer involved in this study adopted 99 endings for subsequent clearance catalogs in response to the results reported here. Further, the retailer declined to participate in a follow-up study after considering the revenue that might be lost from further use of non-99 ending prices.

Limitations and Future Research

The results of this experiment indicate that the 99 price ending *can* cause a sales increase over the equivalent 00 price ending. However, one cannot conclude from this study that such an effect will always occur. How these results can be generalized to other situations depends on the mechanism that caused this 99-ending effect. Unfortunately, the present data shed very little light on the mechanism(s) involved.

The finding of more evidence for an effect of 99 endings on the amounts that customers purchased than on the number of customers purchasing suggests that 99 price endings affected the consumer's how-much-to-buy decision more than the consumer's purchase-versus-not-purchase decision. This difference is suggestive of the underestimation mechanism. The how-much-to-buy decision may be more likely to involve tedious mental calculations that would motivate the consumer to ignore rightmost price digits in order to reduce information-processing effort.

It is interesting to note that the amount of underestimation necessary to account for the study's 99-ending sales effect would be rather modest. If purchasers ignored only a price's two rightmost digits (e.g., perceiving $29.99 as $29), then the mean *perceived* 99-ending catalog price would be $30, which is 3.2 percent lower than the mean 00-ending catalog price of $31. If, say, two-thirds of purchasers ignored these two rightmost digits, then the 2.1 percent perceived price difference resulting in an 8.0 percent sales increase would correspond to price elasticity of −3.8. Such an elasticity is quite within the range of price elasticities that are typically observed (Tellis, 1988).

On the other hand, the results are also consistent with an association mechanism. An increased impression of discount or low price may well have led the 99-ending catalog customers to make larger purchases. Or, it is possible that the 00 endings (and particularly the display of the 00 cents digits) could have weakened the credibility of the claimed discounts and led the 00-ending catalog customers to make smaller purchases. Because the 88 ending had predominated in previous versions of this semiannual clearance catalog, its sales response could be used as an indication of which of these two association effects might have been involved. The findings that the 88-ending catalogs showed both (1) lower sales than the 99-ending catalogs and (2) a reliably higher median purchase amount than the 00-ending catalogs are consistent with the possibility that both association effects could have been involved.

The importance of mechanism for predicting when the 99-ending sales effect will occur suggests that, in future studies, researchers should take note of (and, if possible, manipulate) variables relevant to price-ending effect mechanisms. For example, variables such as the potential underestimation of the prices being tested and the likelihood that consumers will ignore rightmost digits would be relevant to the role that the underestimation mechanism might play. Variables such as the degree to which consumers associate the tested price ending with low or high prices and with low or high quality, and the importance of such associations for the products being used in the test, would be relevant to the role the association mechanism might play.

CONCLUSION

Every time a retail price is set, the manager, at least implicitly, makes a decision concerning the rightmost digits of that price. The key implication of this study is that this decision may have a substantial effect on consumer purchasing. The results of the field experiment reported in this paper demonstrate that, in at least one marketing context, the one penny difference between the 99 and 00 price endings has a considerable effect on sales. This finding suggests that there may be benefits in giving greater managerial attention to the selection of a price's rightmost digits.

NOTES

1 Note that by "potential underestimation," we are referring to the maximum amount of underestimation that *could possibly* occur because of the use of the 99 rather than the 00 price ending. The amount of underestimation that would *actually* occur in any given situation would depend on the extent to which consumers ignore the rightmost price digits.

2.   The lack of statistical significance of this coefficient was not reported in the published paper, but was relayed to us in a personal communication by one of the authors.

3.   For example, completely ignoring the three rightmost digits of $29.88 would be equivalent to ignoring $9.88 of the price (33% of the price), whereas a similar inattention to the three rightmost digits of $30.00 would be equivalent to ignoring nothing.

4.   Because of an error, six of the 169 items in the 88-ending catalog were given price endings lower than 88 (i.e., 77, 55, or 25).

5.   The null hypothesis of the median test is that two independent groups have the same median. The test involves determining the median score for the group consisting of all the scores from both of the groups and then testing whether the two groups have the same proportion of scores above this combined median.

6.   It cannot be determined from these data whether it was (1) the number of items purchased and/or (2) the average price of an item purchased (i.e., the dollar size of the purchase divided by the number of items that were purchased) that was responsible for the larger purchase amounts in the 99 condition. Neither of these two measures alone varied significantly between the 99 and 00 price-ending conditions (items per customer: $t[1887] < 1$, median test $X^2[1] = 2.39, p < .20$; average price of purchased item: $t[1887] = 1.30, p < .20$, median test $X^2[1] = 1.79, p < .20$).

7.   Consistent with an 88-00 purchase-amount difference is the finding that the difference between the purchase amounts for the 88- and 99-ending catalogs was not statistically significant (log transformed purchase amounts, $t(1842) < 1$; median test, $X^2 = 2.24, p < .2$).

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