

Research note

The 99 price ending as a signal of a low-price appeal

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Abstract

There is evidence that the rightmost digits, or endings, of retail prices can communicate meanings to consumers. To better understand how such meanings are formed, this paper addresses the question of how the 99 price ending can have a low-price meaning even though 99-ending prices tend to be higher rather than lower competitive prices. Analysis of two large samples of newspaper price advertising indicates that there is a strong and robust correlation between the use of the 99 price ending and the presence of a low-price appeal such as a claimed discount. It is suggested that the salience of price advertising leads it to dominate other sources of information in the consumer's learning of price-ending meanings.

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It has been well-documented that the rightmost digits, or *endings*, of retail prices do not show an even distribution of the ten possible digits—for example, 0, 5, and 9 are often over-represented (Friedman 1967; Kreul 1982; Rudolph 1954; Schindler and Kirby 1997; Twedt 1965). It has long been proposed that retailers favor certain price endings because of the meanings they can communicate to consumers (e.g., Bader and Weinland 1932; Schindler 1991), and there is recent evidence from field studies that meanings or other factors specific to a particular price ending can have substantial effects on consumer sales (Anderson and Simester 2003; Kalyanam and Shively 1998).

The mechanism by which a price's ending can become meaningful to consumers is not entirely clear. Pricing research has shown that the level of a price can communicate meaning to consumers, such as a high price communicating that the offered item is of high quality (e.g., Dodds et al. 1991; Rao and Monroe 1989). This appears to be at least partially due to consumers learning that higher quality items generally tend to be sold at higher prices (e.g., Lichtenstein and Burton 1989; Riesz 1978; Sproles 1977). In other words, consumers may have learned this price-level meaning from their observations of the association between price and quality that exists in the marketplace.

The question could then be asked, might consumers learn the meaning of a price's ending in a similar way, by simply observing marketplace realities? This question is addressed in this paper by focusing on one particular price ending, the 99 ending (i.e., the rightmost two digits of prices such as \$5.99, \$29.99, and \$199). In the next section of the paper, evidence is reviewed concerning what the 99 ending means to consumers. Then, several possible explanations are considered for how consumers may have learned this meaning. Following that is the report of an empirical investigation that supports one of these explanations. The paper concludes with a discussion of the implications of these results for retailing, public policy, and for the understanding of how consumer process price information.

99-meaning paradox

Evidence from controlled experiments demonstrates that the 99 price ending can communicate to consumers the meaning “low price.” Schindler (1984) found that consumers are generally more likely to judge that a price that ends in either 99 or 98 is one that had not recently been increased. Quigley and Notarantonio (1992) reported that subjects who saw an advertisement with a 99- or 98-ending price were significantly more likely to judge the advertised product as “probably on sale” than were those who saw the same ad with a

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00 ending. Schindler and Kibarian (2001) found that when an item was displayed with a 99-ending price rather than 00-ending price, consumers were more likely to judge the item to be “on sale” and were more likely to believe that they would be unable to find the advertised item “at a price lower than this advertised price.”

The first and simplest explanation for the 99 ending’s low-price meaning is that it results from consumers observing that 99-ending prices tend to be, in fact, prices that are relatively low. However, this possible explanation contrasts sharply with empirical data. Schindler (1997) analyzed the prices from a “market-basket study” of 243 grocery items in six different stores in a single metropolitan area. He found that a 9-ending price was not only unlikely to be the lowest price around for that specific item, but actually was more likely to be among the *higher* prices for the item among the six competing stores. This counterintuitive finding was replicated in a survey of the prices of a set of 120 general merchandise items among ten retailers (Schindler 2001). The prices with the 99 endings were both less likely to be the lowest prices for that specific item and were, on the average, further above the item’s lowest competing price than were prices that ended in 00 or that ended in any other pair of digits other than 99.

This discrepancy between the low-price meaning communicated to consumers by the 99 ending and the likelihood that 99-ending prices are relatively higher rather than lower in the competitive marketplace is termed the *99-meaning paradox*. It indicates that the 99 ending’s low-price meaning cannot be not due to the consumer’s learning a 99-ending/low-price correlation because such a relation is not present in the marketplace. What then could cause the 99 ending’s low-price meaning to be learned and maintained in the minds of consumers? In the next section, two further possibilities are considered.

Further explanations for the 99 ending’s meaning

A second possible explanation for the 99 ending’s low-price meaning is that it results from a consumer tendency to ignore, or give insufficient weight to, a price’s rightmost digits. Such a processing pattern would cause more price-level underestimation in 99-ending prices than in prices with lower endings. Although there is evidence that consumers may indeed give insufficient consideration to rightmost digits (e.g., Bizer and Schindler 2005; Thomas and Morwitz 2005), this effect seems unable to account for the 99 ending’s low-price meaning. For example, if consumers do ignore rightmost digits, it is unclear how they could learn a meaning for those digits. Further, Schindler (2001) found that even if the value of the two rightmost digits of surveyed prices were maximally underweighted (i.e., replaced by 0s in the price-level calculations), prices with 99 endings were still, on average, higher than competing prices with other endings. More broadly, field studies have found evidence for demand-curve peaks, or “spikes,” at 9-ending prices (Anderson and

Simester 2003; Kalyanam and Shively 1998). Such spikes could very well be the result of a low-price meaning of 9-ending prices, but could not be based on insufficient consideration of ending digits. Ignoring or giving insufficient weight to rightmost digits would result in sales “steps” at 9/0-ending transitions rather than the spikes, which involve 9-ending prices generating more sales than lower prices.

A third possible explanation for the 99 ending’s low-price meaning could derive not from the consumer’s tendency to ignore or give insufficient weight to a price’s rightmost digits, but rather from retail managers’ reactions to this consumer tendency (see Gedenk and Sattler 1999). In situations when the goal is to appeal to consumers’ desires for low prices, managers would be motivated to supplement their explicit claim that the price is low or discounted with whatever means is available to make the price actually appear low. Managers who believe that consumers give insufficient consideration to rightmost digits would view reducing an even-dollar price by only one penny (or an even-hundred-dollar price by only one dollar) as an inexpensive way to create lower-price perception and would thus be particularly likely to use the 99 ending. This would result in a marketplace association between the 99 ending and an explicit low-price appeal.

If such a marketplace association exists and consumers learn it through experience, then it could lead to the 99 ending acquiring the meaning of discount and low price in the minds of consumers. Note that the claim of a discount, or other form of low-price appeal in a price advertisement, does not necessarily indicate that the advertised item is in fact being sold at a competitively low price. The legal constraints on the ability of a retailer to advertise that an item has been discounted are generally satisfied if the retailer can show that the sale price is lower than the price that the retailer had formerly charged (e.g., Federal Trade Commission 1967). Thus, a marketplace association between 99 endings and low-price advertising appeals could lead consumers to infer a low-price meaning without the 99 ending being actually associated with relatively low prices.

Goal of this research

For this third explanation to account for the 99 ending’s low-price meaning, there must indeed be a marketplace association between retailers’ use of the 99 ending and low-price appeals. Evidence in this direction was reported in passing by Huston and Kamdar (1996). They collected three prices from each of 27 women’s clothing catalogs and noted that prices from those catalogs whose cover indicated that the products were “low priced, on sale, marked down, or otherwise . . . “good buys” were more likely to end in 9 than were prices from catalogs that did not have such indications. Although suggestive, this result concerns the 9 ending (rather than the 99 ending) and was based on very limited data—only 81 prices, all in the context of women’s clothing catalogs. For such a result to explain the 99 ending’s low-price meaning,

it would have to hold for 99 endings and be demonstrated in a large, varied sample of consumer prices.

The goal of the present paper is to determine if there is a more general marketplace relationship between the 99 ending and a seller's low-price appeal, that is, the presence of a claim that the advertised item is being sold at a discounted price or otherwise represents a savings to consumers. Specifically, it is hypothesized as follows:

Advertised prices that are claimed to be discounts or otherwise claimed to represent consumer savings are more likely to end in the digits 99 than are advertised prices for which no such claims are made.

Data from two large price-advertising samples, collected primarily for other purposes, are used to test this hypothesis.

Method

As has been done in previous research (e.g., Kreul 1982; Rudolph 1954; Twedt 1965), the newspaper medium was used to obtain a sample of retail price advertising. For the first sample of ads (Sample 1), the ads were drawn from an area probability sample of U.S. newspapers with a circulation of 40,000 or more. One newspaper was selected from each of 43 states. For each newspaper, the issue used was the one published on Sunday, September 9, 1990. Advertisements were sampled from each newspaper by first randomly determining whether odd- or even-numbered pages would be used for that newspaper. On each selected page, every advertisement that contained a selling price and was as large as two news columns in width and 4 in. in height was selected. With this procedure, 1415 advertisements were sampled.

A second sample of price advertisements (Sample 2) was obtained from the largest circulation newspaper in each of the six largest U.S. metropolitan areas: the *New York Times*, the *Los Angeles Times*, the *Chicago Tribune*, the *Washington Post*, the *San Francisco Chronicle*, and the *Philadelphia Inquirer*. For each newspaper, the sampled prices were from the copy published on Sunday, May 18, 1997. In Sample 1, only run-of-press ads were included. However, the recent growth of the use of free-standing inserts in newspaper advertising (Warner 1994) suggested that these should also be included. Thus, the ads in Sample 2 included both run-of-press ads and those contained in the newspaper's flyers and inserts. Also, in Sample 2, the category of the advertised product was recorded. Advertisements were sampled from each newspaper by first randomly choosing whether the odd- or even-numbered pages would be selected. For each selected page, every ad that was at least 2 in. high and 2 in. wide and that contained at least one selling price was used in the sample. For flyers and inserts, the whole selected page was considered to be a single ad. This procedure resulted in the sampling of 1391 advertisements.

When a sampled advertisement contained more than one selling price, one of those prices was selected randomly by

use of a clear plastic sheet containing a numbered grid. The sheet was placed over the ad and a random number table was used to select one cell in the grid. The price closest to the chosen cell was selected. The selected price was coded as having the number of digits that appeared in the ad. Thus, a price appearing as "\$139.00" was considered a five-digit price with 00 as its two-digit ending, while a price appearing as "\$139" was considered a three-digit price with 39 as its two-digit ending.

For each selected selling price, the following additional items, if present, were recorded: (1) a reference price—a price included so as to be compared to the selected selling price; (2) a savings amount—a number indicating the size of a savings claimed to be represented by the selling price (e.g., "20 percent off," "Save \$50"); (3) any words or phrases that indicated that the selling price constituted a savings to consumers and/or described the claimed savings (e.g., "year-end sale," "price reduced"). A price advertisement was considered to be making a low-price appeal if it included one or more of these low-price cues—a reference price, a savings amount, or semantic cues claiming that the price represented a savings to the consumer. All other ads were considered to be not making a low-price appeal.

Results

Sample 1

Of the 1415 sampled prices, 1267 (89.9 percent) contained three digits or more, and thus were long enough to have a two-digit price ending. Nine of the prices were over \$500,000. These were most likely ads for upscale real estate, and none of them contained low-price cues. They were considered outliers and excluded from the analysis. The remaining 1258 prices ranged from \$1.07 to \$500,000 with the middle 50 percent falling between \$41.52 and \$2,349. All Sample 1 analyses are based on these 1258 prices. Examination of the rightmost two digits of each of these prices indicated that 99 was the most common price ending, occurring in 21.5 percent of the prices. The next most commonly occurring price ending was 00 (15.6 percent), followed by 95 (13.8 percent). Overall, the ten most commonly occurring endings, the data for which can be seen in the first three columns of Table 1, accounted for more than three-fourths of the price endings observed.

Four hundred and ninety-two prices (39.1 percent) were from ads containing low-price cues. The distribution of two-digit price endings differed markedly between the ads with low-price cues and those without low-price cues. This was true whether the analysis used separate categories for each of the 100 possible two-digit endings ($\chi^2[83] = 143.1, p < .001$) or if the 90 least commonly occurring endings were grouped into an "all others" category ($\chi^2[10] = 64.6, p < .001$).

As can be seen in the first three columns of Table 1, the 99 price ending is used in 28.4 percent of the ads that contain low-price cues, but is used in only 17.0 percent of the ads

Table 1
Incidence of commonly occurring two-digit price endings in advertisements without and with low-price cues

Two-digit price ending	Sample 1			Sample 2		
	Percent of sample (<i>n</i> = 1258)	Percent of ads without low-price cues (<i>n</i> = 766)	Percent of ads with low-price cues (<i>n</i> = 492)	Percent of sample (<i>n</i> = 1034)	Percent of ads without low-price cues (<i>n</i> = 542)	Percent of ads with low-price cues (<i>n</i> = 492)
00	15.6	19.3	9.8 ^a	6.9	10.9	2.5 ^a
29*				1.7	2.0	1.2
49	1.9	1.8	2.0	2.8	3.9	1.6 ^c
50	4.8	5.5	3.7	3.7	5.5	1.6 ^b
79	2.5	1.3	4.3 ^b	1.8	1.8	1.8
88	4.9	4.5	5.7	2.2	0.6	4.1 ^a
90*	4.1	5.2	2.4 ^c			
95	13.8	14.4	13.0	10.5	12.6	8.1 ^c
97	4.6	4.4	4.9	1.9	1.8	2.0
98	2.2	1.3	3.7 ^c	2.4	2.4	2.5
99	21.5	17.0	28.4 ^a	42.9	30.1	57.1 ^a
All others	24.1	25.3	22.1	23.2	28.4	17.5 ^a
Total	100.0	100.0	100.0	100.0	100.0	100.0

* These endings were among the top ten two-digit endings in only one of the two ad samples.

^a Difference from ads without low-price cues significant, $p < .001$.

^b Difference from ads without low-price cues significant, $p < .01$.

^c Difference from ads without low-price cues significant, $p < .05$.

that do not contain low-price cues (this difference is statistically significant, $\chi^2[1] = 22.8$, $p < .001$, odds ratio = 0.51). To obtain an indication of the robustness of this association between the 99 price ending and a low-price appeal, the presence of a low-price appeal (coded 0/1), price level (the selling price displayed in the ad), and the interaction between low-price appeal and price level were used as independent variables in a logistic regression analysis to predict the presence of a 99 ending.

Consistent with the chi-squared test presented above, the presence of a low-price appeal was positively related to the use of the 99 ending ($B = .569$, $p < .001$, odds ratio = 1.77). The price-level term was also significant ($B = -.00004$, $p < .01$, odds ratio = 1.00), the negative coefficient indicating that higher prices are less likely to end in 99. The presence of this term in the model indicates that the effect of low-price appeal occurs above and beyond any effect of price level. The interaction between the effects of low-price appeal and price level was not significant ($p > .05$). This supports the robustness of the association between 99 endings and low-price appeals by showing that it exists as strongly for high prices as for low prices.

If a price-ending/low-price-appeal association existed only for the 99 ending, then removing the 99-ending prices from the data should result in price-ending distributions that do not differ between low-price appeal ads and the ones that do not make low-price appeals. However, this is not the case. Even with the 99-ending prices removed, the distribution of the remaining two-digit price endings (which will be referred to as the *non-99 endings*) differed between the ads with low-price cues and those without low-price cues (separate categories for each of the other 99 possible two-digit endings, $\chi^2[82] = 124.3$, $p = .002$; the 90 least

commonly occurring endings considered as “all others,” $\chi^2[9] = 42.8$, $p < .001$).

The first three columns of Table 1 indicate the two-digit price endings in addition to the 99 ending that were associated with low-price appeals. The 98 ending and the 79 ending showed statistically significant tendencies to occur more often among ads that contained low-price cues ($\chi^2[1] = 6.6$, $p = .01$, odds ratio = 0.35; $\chi^2[1] = 9.7$, $p = .002$, odds ratio = 0.30, respectively). The 00 ending and the 90 ending occurred *less* often among ads that contained low-price cues ($\chi^2[1] = 20.1$, $p < .001$, odds ratio = 2.22; $\chi^2[1] = 5.2$, $p < .05$, odds ratio = 2.20, respectively). Note that the 95 ending, the third most common ending in the sample, did not show any statistically significant association with the presence of a low-price appeal ($p > .5$).

Sample 2

Of the 1391 sampled prices, 1202 (86.4 percent) contained three digits or more. Examination of the product categories indicated that the 168 prices that advertised real estate were almost never coded as containing low-price cues and thus were excluded from the analysis. All Sample 2 analyses are based on the remaining 1034 prices. The prices ranged from \$1.19 to \$400,000, with a median price of \$129. To gain a rough indication of the robustness of effects over product type, the products advertised were grouped into three broad categories: general merchandise (e.g., clothing, electronics, household goods; 678 prices; median price = \$34.99), services (e.g., travel, dining, entertainment; 234 prices; median price = \$179), and automotive items (e.g., new and used cars, accessories; 122 prices; median price = \$11,108).

Examination of the rightmost two digits of each of these prices indicated that the top three price endings were the same as those observed in Sample 1: 99 was the most common price ending (42.9 percent of the prices). The other two of the three most common endings were the 95 ending (10.5 percent) and the 00 ending (6.9 percent). The remaining endings among the top ten in Sample 2 were also highly similar to those in Sample 1 (see Table 1). As in Sample 1, the ten most commonly occurring endings accounted for more than three-fourths of the price endings observed.

As can be seen in the second three columns of Table 1, the 99 price ending is more likely to be used in the ads with low-price cues than in the ads without low-price cues (57.1 percent vs. 30.1 percent; $\chi^2[1]=75.9$, $p<.001$, odds ratio=0.32). As in Sample 1, a logistic regression was carried out to obtain an indication of the robustness of this association. The presence of a 99 ending was regressed on low-price appeal (coded 0/1), price level (the selling price displayed in the ad), service product (coded 0/1), automotive product (coded 0/1), and the interactions between low-price appeal and price level, service product, and automotive product.

There was not a statistically significant effect of price level on the use of the 99 ending ($p>.10$), but there was a significant tendency for there to be fewer 99 endings in ads for service products and in ads for automotive products ($B=-2.276$, $p<.001$, odds ratio=0.10; $B=-1.290$, $p<.001$, odds ratio=0.28, respectively). Controlling for these effects, the presence of a low-price appeal was still positively related to the use of the 99 ending ($B=.874$, $p<.001$, odds ratio=2.40). Moreover, there were no significant interactions between the effect of low-price appeal and price level ($p>.60$), service product ($p>.25$), and automotive product ($p>.30$). Thus, the data again support the robustness of the association between 99 endings and low-price appeals. Whereas Sample 1 showed only robustness across price level, Sample 2 results show robustness across product type as well as across price level within each of the product categories.

As in Sample 1, the Sample 2 data indicated that there were price endings other than the 99 ending that were associated with low-price appeals. The second three columns of Table 1 indicate the non-99 price endings that were associated with low-price appeals. The 88 ending showed a statistically significant tendency to occur more often among ads that contained low-price cues ($\chi^2[1]=13.1$, $p<.001$, odds ratio=0.13). The 00 ending and the 50 ending occurred *less* often among ads that contained low-price cues ($\chi^2[1]=27.5$, $p<.001$, odds ratio=4.89; $\chi^2[1]=10.1$, $p<.01$, odds ratio=3.54, respectively). Two 9-containing endings – the 49 and the 95 endings – also occurred less often among ads that contained low-price cues ($\chi^2[1]=4.0$, $p<.05$, odds ratio=2.44; $\chi^2[1]=4.9$, $p<.05$, odds ratio=1.62, respectively). Note that in neither of the two samples did the 95 ending show the positive association with a low-price appeal that was apparent for the 99 price ending.

Run-of-press ads versus flyers

Because a large proportion of the ads in Sample 2 are not run-of-press ads, but pages from the newspaper's flyers and inserts, it is instructive to look separately at each of these two types of ad. Considered separately, results from the 512 run-of-press ads in Sample 2 look very similar to the ads in Sample 1, which were all run-of-press ads. There were 33.2 percent low-price appeals (39.1 percent in Sample 1), 18.6 percent 99 endings (21.3 percent in Sample 1), 11.7 percent 00 endings (16.2 percent in Sample 1), and 15.0 percent 95 endings (13.7 percent in Sample 1). As in Sample 1, the 99 ending occurred more often when low-price cues were present (32.9 percent vs. 11.4 percent, $\chi^2[1]=33.4$, $p<.001$, odds ratio=0.26), the 00 ending occurred less often when low-price cues were present (4.7 percent vs. 15.2 percent, $\chi^2[1]=11.1$, $p<.001$, odds ratio=3.63), and the 95 ending was not significantly related to the presence of low-price cues ($p>.60$).

By contrast, the results from the 522 flyers and inserts in Sample 2 looked quite different than both Sample 1 and the run-of-press ads in Sample 2. There were far more low-price appeals (61.7 percent), far more 99 endings (66.9 percent), and far fewer 00 endings and 95 endings (2.1 percent, 5.9 percent, respectively). In the flyers and inserts, there was a tendency for 99 endings to occur more often when low-price cues were present (69.9 percent vs. 62.0 percent), but it was only marginally significant ($\chi^2[1]=3.1$, $p=.08$, odds ratio=0.70). There was no statistically significant relation between the 00 ending and the presence of low-price cues ($p>.15$), and the 95 ending occurred less often when low-price cues were present (3.7 percent vs. 9.5 percent, $\chi^2[1]=13.1$, $p<.001$, odds ratio=0.13).

Discussion

The data from two separate systematic samples of price advertising indicate that there is a clear relation in the marketplace between the use of the 99 price ending and the presence of cues for a low-price appeal. This relation appears to be quite strong. In Sample 1, the incidence of the 99 ending was more than two-thirds greater in ads with low-price cues than in those ads without low-price cues. In Sample 2, the 99 ending occurred almost twice as often in the ads that made low-price appeals than in the ads that did not. Further, in both studies, this 99-ending/low-price-appeal relationship was apparent even when the level of the prices was controlled, and it was shown to be robust over price level (Samples 1 and 2) and product type (Sample 2). This evidence, based on 2,292 price ads, provides a strong indication that the 99 price ending serves as a valid signal of a low-price appeal.

This marketplace association between the 99 price ending and low-price appeals provides support for the third explanation of the 99 ending's low-price meaning—that it derives

from retail managers' tendency to supplement a low-price claim with any available means to make the price actually appear low. Advertisements showing 99-ending prices along with low-price claims are salient in the consumer's experience because such ads often catch the consumer's attention. Indeed, the claimed discount and other cues indicating a consumer savings are often relied on as primary attention-getting devices. Consumers' repeated exposure to this salient advertising leads to their learning to associate 99 endings and ostensible low prices. The salience of price advertising makes it far easier to learn this association than to learn the reality of the positive relationship between 99 endings and higher product prices. Thus, a relationship present in marketplace advertising appears capable of playing a dominant role in the development of price-ending meanings.

Limitations of this research

The finding of an association between the 99 ending and low-price advertising appeals was strong and robust in run-of-press newspaper ads, but was only weakly apparent in the flyers and inserts. It is not clear why the flyers and inserts showed so little effect, but one possibility is that retailers may consider all newspaper flyers and inserts to be low-price appeals and thus were maximally likely to use 99 endings in those prices. This possibility suggests that further research on this topic should consider broadening the criteria for low-price appeal, perhaps to include any newspaper flyer or insert that prominently displays price information.

Although the 99-ending/low-price-appeal association found in this investigation is sufficient to account for the 99-ending meaning, there are two other relations apparent in the present data that could also account for it. The first is the finding in Sample 1 that 99 endings are more common among low-priced items than among high-priced ones. Previous research on this relationship has yielded mixed results (Huston and Kamdar 1996; Naipaul and Parsa 2001; Stiving 2000), so further research is warranted. One issue that should be considered in this research is what might be the best "measure" of price ending. In the current investigation, prices such as \$99,900 and \$299,000 were classified as 00-ending prices. To deal with the possibility that place-holding 0s may be less salient than other price digits, it may be useful to explore price-ending measures that ignore such digits (see Simmons and Schindler 2003).

A second relation that could account for the 99-ending meaning is the finding that the 00 ending (the second or third most commonly occurring ending) was less likely to occur in advertisements that made low-price appeals. This finding suggests that consumers' learning of the advertising context in which 00-ending prices are used could lead this ending to acquire the meaning of an undiscounted, "regular" price. Future research on this issue should address the question of the degree to which the 99- and 00-ending associations with low-price appeal are related. For example, if as suggested above, managers try to enhance the effect of a dis-

count claim by lowering a 00-ending price by only a penny (e.g., \$6.00–\$5.99) or a dollar (e.g., \$200 to \$199), then the 99- and 00-ending relations found in this study may simply be different aspects of the same phenomenon.

Implications for retailing practice and public policy

The evidence in this investigation concerning how consumers may learn that the 99 ending means "low price" provides further support for the findings that consumers in fact perceive such a meaning. Given this meaning, use of the 99 price ending would appear to be appropriate as a means to support other low-price cues in retail advertising.

Although the focus of this investigation was the 99 ending, the study has also yielded interesting results concerning the 95 price ending, which is the second or third most commonly occurring two-digit ending. Despite often being considered similar to the 99 ending, the 95 ending was found in both Samples 1 and 2 to be *not* positively correlated with low-price appeals. If managers who use a price's ending to reinforce their communication of a low-price message favor the 99 ending (perhaps to avoid losing the 4-cent or 4-dollar difference from a 95-ending price), then this may lead the 95 ending to have meaning connotations that differ from those communicated by the 99 price ending. Thus, in contrast to the 99 ending, the 95 ending may *not* be an appropriate means to support other low-price cues in retail advertising.

The possibility of a substantial meaning difference between the 99 ending and the 95 ending suggests that the meaning connotations of a price's rightmost digits may be more ending-specific than has been generally assumed. For example, although not consistent between the two samples, there was some evidence in this investigation that the endings 79, 88, and 98 are positively correlated with low-price appeals and the endings 49, 50, and 90 are negatively correlated. These findings suggest the value of further research investigating whether these price endings indeed carry meaningful connotations. One approach to uncovering possible meanings of these price endings would be to look at the relationships in retail price advertising between these price endings and the specific semantic cues used in the ads to describe the featured prices.

The support in this paper for the role of price advertising in creating and maintaining price-ending meanings also suggests the possibility that these meanings can be deliberately managed. Retailers who advertise heavily may be able to contribute to the development of new price-ending meanings in the minds of consumers. For example, the apparent strategy of Wal-Mart to specifically avoid the 99 price ending may eventually change how the 99 ending and others are perceived by consumers.

As for the implications of this research for public policy, it is relevant to return to the phenomenon of the 99-meaning paradox. It may well be a cause for concern that the salience of price advertising can so effectively overshadow the relationship between price endings and price levels that

is actually present in the marketplace. This would be particularly so if retailers were found to intentionally exploit price-ending meanings by, for example, favoring 99 endings for prices known to be relatively high. Responses to such abuses could include promoting consumer awareness of the issue and tightening the rules governing the truth of retailer claims of discount and relative low price.

Overall, the results of this investigation suggest that retailers, as well as regulators and consumers, should give explicit consideration to the meanings that can be transmitted by the rightmost digits of product prices and price advertising. These results also support the value of further research on the connotations of specific price endings and on the psychological mechanisms by which the rightmost digits of a retail price can become a meaningful element in marketing communication.

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