

An Historical Analysis of the Endings Used in Advertised Prices

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The digits to the right of a price's leftmost digit are referred to as the price's ending. A number of studies have confirmed the common observation that price endings are highly likely to contain the digit 9 (e.g., Friedman 1967; Krueger 1982; Rudolph 1954; Schindler and Kirby 1997; Twedt 1965). Research has also indicated that the retailer's use of 9-ending prices can have positive effects on factors such as price recall (e.g., Schindler and Wiman 1989) and price impression (e.g., Schindler and Kibarian 2001), and is capable of increasing sales (Kalyanam and Shively 1998; Schindler and Kibarian 1996; Stiving and Winer 1997).

Although price endings have been the subject of academic research since 1932 (Bader and Weinland 1932), there have been no published studies on how retailers' choice of price endings has, or has not, changed over time. The origins of the use of 9-ending prices is often explained by a story, which is probably apocryphal (e.g., Hower 1943, p. 52). According to the story, Rowland Macy, or some other retailing pioneer, came up with the clever idea of dropping prices by one penny so that his sales clerks would have to give the customer change and therefore be obliged to use the cash register rather than pocketing the payment.

This study is designed to be a first systematic look at the price endings used by retailers over time. Because of the recent availability of all the back issues of several major U.S. newspapers in electronic form, this type of study has now become considerably more practical. This study will include the sampling of price advertisements from the *New York Times* starting in 1860, the first year in which display ads (versus classified ads) are present in substantial number, and continuing at 20-year intervals to 2000.

Broadly, this study is designed to address three research questions. The first question involves how the type of price ending commonly used has changed over time. Price endings can be categorized into three groups: round-number endings (0 and 5), just-below endings (9), and irregular endings (all other digits). If, say, just-below endings are less common in the 19th Century, then what type of ending was in their place – round endings or irregular endings?

The second question involves how the use of just-below endings has developed over time. When did their use begin? Did their use increase suddenly after their introduction, or was the growth more gradual? If we examine the rightmost two digits rather than the rightmost

single digit, were the early 9-ending prices 99 endings, or were the 9s used in other two-digit endings (e.g., 29, 89, 95, etc.)?

The third question involves the context of the use of just-below endings. For example, it has been observed that in current times, use of just-below endings is strongly related to the presence of cues, such as the display of a higher reference price or words such as "On sale!", which suggest that the advertised price is a discount or otherwise low price (Schindler 2002). Was this also true in the early use of just-below endings?

The full data set for this study will consist of 2400 advertised prices selected from ProQuest's *New York Times* archives. There will be 300 advertised prices from each of the following eight years: 1860, 1880, 1900, 1920, 1940, 1960, 1980, and 2000. The procedure for selecting price advertisements for a selected year begins with randomly selecting a date in that year. For the *New York Times* issue of that date, up to ten display advertisements that show a prominent price are selected. Then the date eight days later is determined, and up to ten display ads in the *New York Times* issue of that date are selected. If incrementing a date by eight days produces a date beyond December 31, the count wraps to January 1 in the selected year. This procedure is continued until 300 advertised prices are selected for the year.

If a selected advertisement contains more than one price, then one price is randomly selected from that ad. The digits recorded for each selected price include only the digits appearing in the ad. For example, if "\$25" appears in an ad, it would be considered a two-digit price ending in 5. If "\$25.00" appears in the ad, it would be considered a four-digit price ending in 0. If present, a reference price and any words describing either the selected price or the reference price are also recorded. In addition, the product category being advertised is noted.

At the conference, the results of this study will be presented and some implications discussed. By tracking the history of the use of just-below pricing, we can gain valuable clues to the information that retailers have intuitively learned from their everyday observation of consumer price response that has led them to the current widespread use of this distinctive and interesting pricing practice.

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REFERENCES

Bader, L. and J. D. Weinland 1932. Do odd prices earn money? *Journal of Retailing* 8 (January): 102-104.

Friedman, L. 1967. Psychological pricing in the food industry. In *Prices: Issues in Theory, Practice, and Public Policy*, edited by A. Phillips and O. E. Williamson, 187-201. Philadelphia: University of Pennsylvania Press.

Hower, R. M. 1943. *History of Macy's of New York: 1858-1919*. Cambridge, MA: Harvard University Press.

Kalyanam, K. and T. S. Shively 1998. Estimating irregular pricing effects: A stochastic spline regression approach. *Journal of Marketing Research*, 35 (February): 16-29.

Kreul, L. M. 1982. Magic numbers: Psychological aspects of menu pricing. *Cornell Hotel and Restaurant Administration Quarterly*, 23 (August): 70-75.

Rudolph, H. J. 1954. Pricing for today's market. *Printers' Ink*, 247 (May 28): 22-24.

Schindler, R. M. 2002. The 99 price ending as a signal of a low-price appeal. Working paper, Rutgers University, Camden, NJ.

_____ and T. Kibarian 1996. Increased consumer sales response through use of 99-ending prices. *Journal of Retailing*, 72 (Summer): 187-199.

_____ and _____ 2001. Image communicated by the use of 99 endings in advertised prices. *Journal of Advertising*, 30 (Winter): 95-99.

_____ and P. N. Kirby 1997. Patterns of rightmost digits used in advertised prices: Implications for nine-ending effects. *Journal of Consumer Research*, 24 (September): 192-201.

_____ and A. R. Wiman 1989. Effect of odd pricing on price recall. *Journal of Business Research*, 19 (November): 165-177.

Stiving, M. and R. S. Winer 1997. An empirical analysis of price endings with scanner data. *Journal of Consumer Research*, 24 (June): 57-67.

Twedt, D. W. 1965. Does the '9 fixation' in retail pricing really promote sales? *Journal of Marketing*, 29 (October): 54-55.