Hospitality Managers’ Price-Ending Beliefs: A Survey and Applications

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Abstract
The use of “just-below” pricing (such as pricing an item at $6.99 or $6.95, rather than $7.00) has been common in some segments of the hospitality industry (such as quick-service and mid-scale dining). The results of a detailed survey of the price-ending beliefs of hospitality managers show that many believe that just-below prices connote good value and round-number prices connote high quality. Furthermore, the majority of these managers believe that consumers tend to drop off or otherwise give insufficient consideration to a price’s rightmost digits. Although one might expect this drop-off belief among those managers who use just-below price endings, it is found also in a majority of those managers who do not use just-below price endings. The survey results suggest that managers who decline the benefits of a consumer drop-off tendency do so because they also believe in one or more possible negative consequences of using just-below price endings. These include the beliefs that just-below endings (1) impair perceptions of high quality, (2) work against an upscale image, (3) give an impression of not being fully honest or straightforward, and (4) involve inconvenience in calculating or communicating the price or in making change.

Keywords
99-cent pricing, managers’ beliefs, price endings, just-below pricing, restaurants

Numerous surveys of hospitality and other retail prices have documented that the distribution of rightmost, or ending, price digits is not random (Kreul 1982; Naipaul and Parsa 2001; Rudolph 1954; Schindler and Kirby 1997; Twedt 1965). Of particular interest is the overrepresentation of 9s and other digits that make a price fall just below a round number, as in prices such as $2.49, $29.95, and $198. These endings, which we refer to as just-below price endings, are characterized by (1) high rightmost digits and (2) leftmost digits that are lower than they would be if the round-number price had been used. Just-below pricing has been shown to be associated with higher sales (Anderson and Simester 2003; Gueguen et al. 2009; Schindler and Kibarian 1996), although that is not always the case (Blattberg and Wisniewski 1987; Bray and Harris 2006).

One approach to developing an understanding of the circumstances under which just-below price endings are connected with sales increases is to examine the relevant beliefs of hospitality managers. Their continual long-term involvement in the activities of setting prices and observing customers’ response should lead their beliefs to reflect consumers’ attitudes toward pricing. Although studies have attempted to make inferences about managerial beliefs from observations of firms’ price-ending behavior (Stiving 2000) or from simulating managerial behavior (Ruffle and Shhtudiner 2006), we think it would be more effective simply to survey experienced hospitality managers about their price-ending beliefs.

In this article, we review two psychological mechanisms regarding how just-below price endings may affect consumer purchasing behavior—the drop-off mechanism and the meaning mechanism. Then we report the results of a survey where we asked hospitality managers directly about their beliefs regarding these two psychological mechanisms and how these beliefs relate to their price-setting behavior. We draw from these results an integrated view of the price-ending decision process of hospitality managers.

Two Psychological Mechanisms of Price-Ending Effects

Drop-Off Mechanism
Perhaps the most commonly suggested mechanism for the effects of just-below pricing on sales is the possibility that

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consumers drop off; ignore, presume, or in some way give insufficient consideration to a price’s rightmost digits (Basu 1997; Brenner and Brenner 1982; Stiving and Winer 1997). We call this the drop-off mechanism. There is evidence for the existence of this mechanism from studies of the consumer’s price perception and recall (Bizer and Schindler 2005; Manning and Sprott 2009; Schindler and Wiman 1989; Thomas and Morwitz 2005). Also, recent work has tied this drop-off tendency to the operation of the anchoring heuristic (Tversky and Kahneman 1974) in quick and automatic “system 1” mental processing (Thomas and Morwitz 2009).

Furthermore, it has been pointed out that it would take only a small amount of drop-off effect to make just-below pricing worthwhile. One published analysis (Gedenk and Sattler 1999) suggests that, for a typical grocery product, even if consumers perceptually drop off rightmost 9s as rarely as 1.5 percent of the time, the use of just-below price endings would still be profitable for the retailer.

**Meaning Mechanism**

A second commonly suggested mechanism for the effects of just-below pricing on sales is the possibility that consumers learn associations or connotations to price endings that contain the digit 9 (Schindler and Kibarian 2001). We call this the meaning mechanism. Schindler (2006) has offered empirical support for the possibility that the 9 ending connotes or is perceived as a signal of a discount or otherwise low price. Other research has found that 9-ending prices are judged by consumers as less likely to have recently increased, as more likely to represent discount prices, and as more likely to be the lowest prices around (Schindler 1984; Quigley and Notarantonio 1992; Schindler and Kibarian 2001). Consumers who are seeking a low-price quick-service restaurant have been found to respond more favorably to one with 9-ending menu prices rather than 0-ending menu prices (Naipaul and Parsa 2001).

Note that if it is possible for the use of the digit 9 in a just-below price ending to acquire favorable associations, it is also possible for it to acquire negative associations. Because a just-below price tends to bring to mind the round-number price a cent or so higher (Schindler and Kirby 1997), consumers are aware that a just-below price represents an influence tactic. This “persuasion knowledge” might lead them to feel manipulated by the price setter (Friestad and Wright 1994). Indeed, it has been found that the perceived quality and classiness of a high-quality retailer could be enhanced by the use of 0- rather than 9-ending prices (Schindler and Kibarian 2001), and that consumers who are seeking a relatively high-priced, fine-dining restaurant respond more favorably to one with 0-ending (as opposed to 9-ending) menu prices (Naipaul and Parsa 2001).

**Research on Managerial Price-Ending Beliefs**

Although there have been a number of surveys of managers regarding their pricing beliefs and practices (Gordon et al. 1981; Noble and Gruca 1999; Paun, Compeau, and Grewal 1997; Samiee 1987), only one, published by Blinder and his associates (Blinder et al. 1998), has specifically addressed managers’ beliefs concerning the effects of a price’s rightmost digits. Their questionnaire, administered to 200 managers from a broad sample of U.S. businesses, included the following question (Blinder et al. 1998, 324-25):

> Another idea is that particular threshold prices are more attractive to customers than other prices. For example, a store might think that a shirt sells much better at $19.95 or $20 rather than $20.10. Is this idea true in your company/division?

Blinder and his colleagues found that 50 percent of the managers surveyed answered yes to this question. Furthermore, they found that responses differed depending on the degree to which the respondent’s company sold products to consumers. Of the 111 firms in their sample that sold products to only business customers (B2B), only 34 percent answered yes to this question. Of the 89 firms that sold at least some of their products to consumers (B2C), 71 percent answered yes to this question. Of the 17 firms that sold all of their products to consumers, 88 percent answered yes.

Although these results do indicate a widespread managerial belief that the price response of consumers is affected by psychological factors specific to certain price endings, their implications for just-below pricing are unclear, because the question lumped the round-number price, $20, together with the just-below price, $19.95. Thus, rather than revealing managers’ beliefs regarding the effects of just-below pricing, this question appears to address only the related, but separate, issue of “sticky prices,” which Blinder et al. acknowledge is their main concern.

**Research Questions**

In this study, we separated those two prices to survey the beliefs of hospitality managers concerning the effects of using just-below and round price endings and how these beliefs relate to their price-ending choices. Our specific research questions are as follows:

1. To what extent do hospitality managers believe in the drop-off mechanism?
2. To what extent do hospitality managers believe that 9 endings connote low prices and 0 endings connote high quality?
3. What other beliefs do hospitality managers have regarding 9 and 0 price endings?
4. How do these beliefs interact to result in the managers’ price-ending choices?

**Method**

**Questionnaire**

To test the above questions, we analyzed data from a survey of restaurant managers that was carried out as part of a larger study of consumer–manager pricing interactions. The food-service industry has been the subject of previous price-ending research (e.g., Kreul 1982; Naipaul and Parsa 2001) and it offers a large population of managers who are likely to have both price-setting involvement and relatively close contact with customers. Furthermore, the National Restaurant Association provides a specific and well-accepted method to classify high- and low-end restaurants based on menu prices, thus offering a convenient and useful means of segmenting the sample.

The survey questions were developed from a series of focus groups and informal interviews with restaurant managers. A preliminary draft of the questionnaire was then pretested on a small sample of restaurant managers (n = 64) and revised based on their feedback. This instrument was adapted from the earlier studies by Naipaul and Parsa (2001) using restaurant menus.

The questionnaire used in the study consisted of three groups of questions. The first group concerned the manager’s price-ending choices and the reasons for these choices. It included a brief definition of price ending and then the question, “Which price ending do you use the most?” with the choices 00, 50, 95, 99, and other. Following that was the open-ended question “Why do you use this price ending the most?”

The second group of questions concerned the manager’s beliefs about the consumer’s price-ending responses. Respondents answered each item in this section by use of a 4-point scale with the points labeled, strongly disagree, disagree, agree, and strongly agree. To measure belief in the drop-off mechanism, the respondents were asked to indicate their level of agreement with the following four items:

- The price ending “00” increases consumers’ perception of overall high value.
- The price ending “99” increases consumers’ perception of overall high value.
- The price ending “00” increases consumers’ perception of overall high quality.
- The price ending “99” increases consumers’ perception of overall high quality.

The phrase *high value* was used to measure low price or discount (coupon-based) connotations, because this phrase is generally used in the restaurant industry to refer to low or discount prices (coupon-based).

The third group of questions concerned characteristics of the organization (e.g., type of food offered, number of employees, average guest check) and characteristics of the respondent (e.g., title, number of years in the present job title).

**Administration of Questionnaire**

We sent a questionnaire by first-class mail addressed to the “manager” of 811 restaurants, approximately half of which were listed in the *Foodservice Operators Guide* (2000) as upscale, full-service restaurants and half as quick-service restaurants. Three weeks after the questionnaires were mailed, a reminder card was sent to the same address.

**Sample**

We chose the restaurant industry as our sample frame for the following reasons: (1) restaurant products are experience goods, where quality and value cannot be easily discerned prior to initial consumption; (2) fine-dining restaurants tend to be promoted as offering high-quality products and services and quick-service restaurants (fast-food) tend to be promoted as offering high-value meals; and (3) restaurants and menu prices have often been used in research on the practice of just-below pricing (Parsa and Hu 2004; Naipaul and Parsa 2001; Schindler and Warren 1988; Kreul 1982).

Our sample excluded large chain operations because they often set menu prices at the corporate level and may not let local managers know the rationale for the pricing practices.

Eighty-one questionnaires were returned for address errors, reducing the effective size of the mailing to 730 restaurants. We received completed questionnaires from 112 of these, for an effective response rate of 15.3 percent. Although this response rate may appear to be low, it should be noted that it is within the limits (13-20 percent) suggested by Agle, Mitchell, and Sonnenfeld (1999). Furthermore, our questionnaire was addressed to the upper management of the respondent organizations. Numerous published surveys of high-level managers in the hospitality field have reported comparable response rates (e.g., Wood 2001; Gamio and Sneed 1992; Bologlu and Mangaloglu 2001; Chung-Herrera, Enz,
Fifty-seven (50.9 percent) of the 112 responding restaurants were upscale, full-service restaurants. The most common cuisine was Italian (24.6 percent), followed by French, American, steaks, and seafood. The average guest check (average purchase amount per customer per visit) at these restaurants was between $25 and $30. Seventy-seven percent of the responding upscale, full-service restaurants had been in business for more than ten years, and 82.5 percent were independently owned.

The remaining 55 of the 112 responding restaurants were quick-service restaurants. The most common food type served was hamburger (45.5 percent), followed by pizza, fried chicken, sandwiches, and Mexican food. The average check was under $6.00. Ninety-three percent of the responding quick-service restaurants had been in business for more than ten years. Twenty-seven percent were independently owned, and 63.6 percent were owned by franchisees.

Seventy-one percent of the survey’s respondents held the title of owner, partner, president, CEO, general manager, or executive vice president. Nineteen percent held the title of business manager, VP of operations, or director of marketing. Sixty-seven percent of the respondents had been with their organizations for six years or more.

### Results

#### Price Endings Used

The respondents’ answers to the question about the price ending that their restaurant most often used were grouped into two categories, round or just-below. Respondents who reported most often using 00, 50, or a 5-ending price other than 95 were classified as using a round ending. Respondents who reported most often using 99, 95, or any two-digit sequence ending in 9 were classified as using a just-below ending. About one-third of the sample (31.2 percent) fell into the round endings group, with the remaining 68.8 percent in the just-below subset. Among upscale, full-service restaurants, a slight majority (52.6 percent) used round endings, whereas more than 90 percent of the quick-service restaurants used just-below endings.

#### Belief in Drop-Off Mechanism

We tested the consistency of the four questionnaire items used to measure the respondent’s belief in the drop-off mechanism with a factor analysis, which produced two factors with eigenvalues greater than one. The first factor consisted of three of the four items, and the second factor consisted of the single remaining item. This remaining item was, “When price is changed from $6.75 to $6.99, consumers won’t notice the difference.” This finding of two factors can be interpreted as indicating two levels of drop-off mechanism belief. The basic level, found in the first factor, is the belief that a price change of a given size matters more when the leftmost digit changes than when it does not (the three items in the first factor all referred to that). This implies belief that the rightmost digits are given insufficient consideration compared to the leftmost digits (insufficient even recognizing that cents digits are less important than dollar digits), but does not require believing that these digits are entirely ignored. An example of a way this could occur would be if consumers “anchored” on the leftmost digit (Thomas and Morwitz 2009). The higher level, indicated by the second factor (the statement that consumers won’t notice an increase from $6.75 to $6.99), is belief in a stronger version of the drop-off mechanism, namely, that rightmost digits are ignored entirely.

The three items in the basic level of drop-off belief showed an acceptable level of reliability (coefficient alpha = 0.71). If responses of either agree or strongly agree are used to indicate belief in an item and belief in at least two of the three basic-level items is considered the criterion for the basic level of drop-off belief, then more than four of five respondents (81.3 percent) indicated the basic level of drop-off belief. Fewer, but still a substantial majority (69.6 percent), agreed or strongly agreed with the notice-the-difference item and thus showed the higher level of drop-off belief.

It should be noted that only 3 (2.7 percent) of the 112 managers responding to our questionnaire disagreed with all four of the drop-off mechanism items. Thus, if we relax the criterion for drop-off belief to include agreement with any one expression of this idea, then it appears that among hospitality managers at least some belief in the drop-off mechanism is almost universal.

#### Belief in 9 Connoting Low Price and 0 Connoting High Quality

Almost two-thirds of respondents, 62.5 percent, agreed (i.e., responded either agree or strongly agree) with the statement that the 99 ending increases consumers’ perception of overall high value. Only 19.6 percent agreed with the statement that the 00 price ending communicates a high-value meaning (this value-perception difference between 99 and 00 is significant by a sign test, z = 5.26, $p < .001$). Almost half of the respondents, 42.9 percent, agreed with the statement that the 00 ending increases consumers’ perception of overall high quality. Only 21.4 percent agreed with the statement that the 99 price ending communicates a high-quality meaning (and this quality perception difference between 99 and 00 is significant by a sign test, z = 2.83, $p = .005$). These results indicate that managers believe in the notions that 99 price endings connote good value and 00 price endings connote high quality.
Exhibit 1: Price-Ending Beliefs of Respondents from Restaurants Using Just-Below and Round Endings

<table>
<thead>
<tr>
<th>Belief</th>
<th>% Agreeing Among Total Sample (n = 112)</th>
<th>% Agreeing Among Those from Restaurants Using Just-Below Price Endings (n = 77)</th>
<th>% Agreeing Among Those from Restaurants Using Round Price Endings (n = 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-off, basic</td>
<td>81.3</td>
<td>89.6</td>
<td>62.9*</td>
</tr>
<tr>
<td>Drop-off, not notice rightmost digits</td>
<td>69.6</td>
<td>74.0</td>
<td>60.0</td>
</tr>
<tr>
<td>99 endings increase perception of value</td>
<td>62.5</td>
<td>71.4</td>
<td>42.9*</td>
</tr>
<tr>
<td>00 endings increase perception of quality</td>
<td>42.9</td>
<td>24.7</td>
<td>82.9#</td>
</tr>
</tbody>
</table>

\* Difference from just-below group significant, \(p < .01\).  
\# Difference from just-below group significant, \(p < .001\).

Relation of Price-Ending Beliefs to Price Endings Used

To explore how these price-ending beliefs may interact to influence the respondents’ price-ending choices, these beliefs can be examined separately for those respondents whose restaurants most often use just-below endings and those whose restaurants most often use round endings (see Exhibit 1).

Although the percentage of respondents who believe in the drop-off effect is lower among those whose restaurants use round price endings—significantly so for basic drop-off belief, 62.9 percent versus 89.6 percent, \(\chi^2(1) = 9.62, p = .002\)—there is still substantial belief in the drop-off mechanism among those managers. In other words, even among those managers whose restaurants most often use round price endings, a sizable majority believe in the drop-off mechanism—62.9 percent for the basic drop-off mechanism, and 60.0 percent for the higher level of drop-off belief.

Although a majority of both groups of managers professed belief in the drop-off mechanism, they differed regarding the two types of meaning beliefs studied. Fewer respondents whose restaurants use round price endings indicated belief that 99 endings increase the consumer’s perception of high value than did those whose restaurants use just-below price endings (42.9 vs. 71.4 percent), \(\chi^2(1) = 7.21, p = .007\). The situation was reversed for the belief that 00 endings increase the consumer’s perception of high quality. Far more respondents whose restaurants use round price endings indicated their belief in this meaning mechanism—82.9 percent for the basic drop-off mechanism, and 60.0 percent for the higher level of drop-off belief.

Among those respondents whose restaurants most often use round price endings, just over one-fourth (28.6 percent) included a mention of the consumer’s perception of high quality. This is consistent with the earlier finding that these managers are very likely to believe that 00 endings increase perceptions of quality. However, in the open-ended question, the respondents whose

The finding that most of the respondents whose restaurants use round endings believe in the drop-off effect raises the question of why their organization uses round endings despite their belief in a psychological mechanism that would make the use of just-below endings beneficial. To get some insight into this question, we examined the answers to the open-ended question asking the reason their restaurant used the price endings that it did. We placed these answers into categories, as shown in Exhibit 2.

Exhibit 2: Explanations from Open-Ended Question

<table>
<thead>
<tr>
<th>Explanation</th>
<th>% of Those from Restaurants Using Just-Below Price Endings (n = 77)</th>
<th>% of Those from Restaurants Using Round Price Endings (n = 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-off mechanism</td>
<td>37.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Perception of low price or good value</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td>Better appearance</td>
<td>1.3</td>
<td>28.6</td>
</tr>
<tr>
<td>Better perception of quality</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>More upscale image</td>
<td></td>
<td>20.0</td>
</tr>
<tr>
<td>More honest</td>
<td></td>
<td>11.4</td>
</tr>
<tr>
<td>Greater convenience or less effort</td>
<td></td>
<td>22.9</td>
</tr>
<tr>
<td>Tradition, competition, etc.</td>
<td>9.1</td>
<td>5.7</td>
</tr>
<tr>
<td>No explanation</td>
<td>19.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
restaurants used round endings also gave three other interesting reasons:

1. Use of round endings creates a more upscale or classy image. For example, one respondent wanted to avoid the appearance of “nickel and diming” customers.
2. Use of round endings seems more honest. Respondents used phrases like “the most forthright,” a more “straightforward approach,” and “gives no thought of deception.”
3. Use of round endings was associated with greater convenience. Respondents mentioned ease of calculation, ease of verbal communication, and ease of making change.

These explanations suggest additional managerial price-ending beliefs that seem worthy of further study.

Among those respondents whose restaurants most often used just-below endings, more than a third of them (37.7 percent) gave some version of the drop-off mechanism as the explanation for their price-ending choice. Examples include:

- “as close as possible to next highest dollar without crossing the actual price threshold”
- “I think we get credit for being 99 cents—one cent less than the dollar.”

Most of the rest of those from just-below-ending restaurants who gave explanations cited the low-price, good-value meaning (e.g., “seems a better value”) or the better “appearance” of a just-below price (e.g., “appealing look on the menu board”), by which they probably meant that it had the appearance of a lower price.

Discussion

An important finding of this study is that belief in the drop-off mechanism of price-ending effects is widespread among hospitality managers. More than four of five managers agreed with at least two of the basic drop-off belief items, and almost all of the managers surveyed agreed with at least one statement expressing the drop-off mechanism. This result helps clarify the Blinder group’s findings, and it demonstrates the extensive belief in the drop-off mechanism among business managers whose companies sell to consumers. Furthermore, the results of this study indicate widespread managerial belief in the meaning mechanism of price-ending effects. Most managers expressed belief that 99 endings increase the consumer’s perception of value and many agreed that 00 endings increase the consumer’s perception of high quality.

With regard to price-ending effects, these results concerning managerial beliefs complement the existing laboratory data supporting the drop-off mechanism (Bizer and Schindler 2005; Manning and Sprott 2009; Schindler and Wiman 1989; Thomas and Morwitz 2005) and the meaning mechanism (Naipaul and Parsa 2001; Schindler and Kibarian 2001). Although the laboratory studies were conducted under rigorous experimental conditions, their generality to an actual business environment has not been established. By contrast, our findings reflect the beliefs of a large number of experienced managers, from a diverse variety of restaurants located all over the United States. The widespread belief in the drop-off and meaning mechanisms found in our survey adds important support for these from the real world, because we attribute much wisdom to the collective intuitions of people who have long-term everyday contact with the buying public.

Furthermore, the analysis of our open-ended question concerning reasons for the restaurant managers’ price-ending choices has revealed additional possible meaning connotations of a price ending. The statements suggesting that round price endings communicate an upscale image agrees with the previous finding that 00 endings can support the perceived classiness of an upscale merchant (Schindler and Kibarian 2001). On the other hand, the statements suggesting that round-number endings give the image of being more honest have not been explicitly considered in past price-ending research. This suggestion fits with Friestad and Wright’s (1994) Persuasion Knowledge Model and would be an interesting direction for future study. The statements suggesting that round endings have the advantage of greater convenience, while distinguishable from a meaning connotation, is nevertheless also a promising topic for future study.

Although we can expect such further research on these topics over the next few years, we can also draw from the present results some tentative conclusions as how managers make their price-ending choices. The extensiveness of the managerial belief in the drop-off mechanism suggests that managers might always choose just-below price endings were it not for possible negative consequences of doing so. The data in our study suggest the following four types of such negative consequences:

- Impaired perception of product quality,
- Difficulty in establishing an upscale hospitality image,
- Implications of not being fully honest or straightforward, and
- Lessened convenience of calculating or communicating the price or of making change.

Even though hospitality managers may not explicitly go through such a two-step decision process, our study of managerial beliefs and behaviors suggests that they do use a choice process that is similar in effect to the two-step process. Furthermore, it seems to us that the explicit version
of this choice process constitutes a sensible decision rule, given our current state of knowledge concerning price-ending effects.

Although the data for this study come only from restaurant managers, these results provide the most detailed look to date at managerial price-ending beliefs. Our results add support to other research evidence for the existence of two important mechanisms by which price endings may influence consumer behavior, and they suggest some areas for future research. Furthermore, these results suggest the possibility of negative consequences of using just-below price endings. This reminds the hospitality manager that, rather than being an easy, “nothing to lose proposition,” the decision about whether to use just-below price endings is one worthy of careful deliberation.

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