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$ or Dollars:
Effects of Menu-price Formats on Restaurant Checks

Cornell Hospitality Report
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by Sybil S. Yang, Sheryl E. Kimes, Ph.D., and Mauro M. Sessarego

From Article at GetOutOfDebt.org

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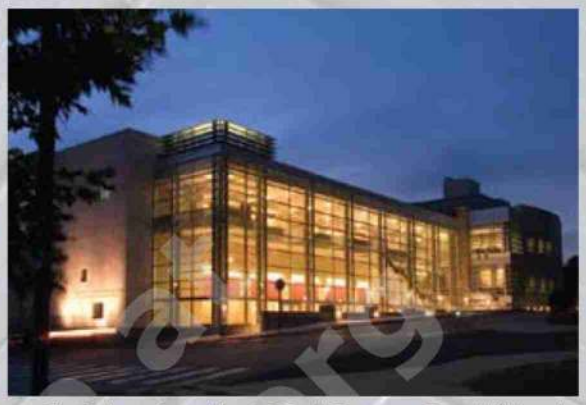

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From Article at GetTheDebt.org

$ or Dollars:
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From Article at GetOutofDebt.org

EXECUTIVE SUMMARY

Empirical research on menu design and price presentation has focused primarily on menus' effects on consumers' attitudes, and not necessarily on actual purchase behavior. This study examines how customers reacted to menus' price formatting in terms of actual sales, as measured by check totals for lunch at St. Andrew's, the restaurant at the Culinary Institute of America, in Hyde Park, New York. Price formats tested in the study were a dollars and cents numerical format with a dollar sign ($00.00), a numerical format without a dollar sign (00.), and scripted or written-out prices (zero dollars). While the numerical manipulation did not significantly affect total spending when compared to such non-menu factors as party size or length of time at the table, the price formats did show noticeable differences. Contrary to expectations, guests given the numeral-only menu spent significantly more than those who received a menu with prices showing a dollar sign or those whose menus had prices written out in words. Psychological theory, by contrast, predicted that the scripted format would draw higher sales. Although these findings may apply only to lunch at this particular restaurant, they indicate that menu-price formats do influence customers' spending, both in terms of total check and spending per cover.

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Mauro M. Sessarego, C.H.E., is associate professor and *maître d'* instructor in St. Andrew's Café at the Culinary Institute of America (m_sessar@culinary.edu). One of five public restaurants on the CIA's main campus in Hyde Park, New York, St. Andrew's Café is also a classroom for students in the CIA's culinary arts degree program, where Sessarago teaches table service principles and skills by providing customer service in a restaurant setting. Students focus on guest relations, professional communications, service sequence, table skills, and dining room preparation. In addition to studies at the Istituto Tecnico Nautico in Genoa, Italy, before joining the CIA faculty, he held various restaurant ownership and management positions in both Italy and the United States, including owner–manager of Le Firme and general manager of Harry's Bar in Genoa; manager of Morgan Restaurant in Greenwich, Connecticut, and Remi and Le Madri in New York City; partner and general manager of Maxx Restaurant in New York City; and general manager of Moreno's in New York City.

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The act of handing a menu to a restaurant guest has been described as, "The ability to place an advertisement in every customer's hand before they part with their money."[1] In this vein, a plethora of consultants, graphic designers, and restaurant revenue management practitioners have sought to use clever copy, shrewd "value pricing" ploys, design layout, and typography to influence consumers' purchases. Though there is some evidence relating these design tactics to increased consumer attention, no empirical relationship has been established between attention and purchase behavior.[2]

[1] A.H. Kelson, "The Ten Commandments for Menu Success," *Restaurant Hospitality,* Vol. 78, No. 7 (1994), p. 103.

[2] Gallup Report, "Through the Eyes of the Customer," *Gallup Monthly Report on Eating Out*, Vol. 7, No. 3 (1987), pp. 1-9; and D. Reynolds, E.A. Merritt, and S. Pinckney, "Understanding Menu Psychology: An Empirical Investigation of Menu Design and Consumer Response," *International Journal of Hospitality & Tourism Administration,* Vol. 6, No. 1 (2005), pp. 1-10.

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In this study, we examined whether restaurant a menu's price formatting can affect consumers' purchase behavior. Specifically, we looked at whether customer spending varied depending on whether the menu price was presented in numerals with a dollar sign and cents ($20.00), in numerals with only even dollars and no dollar sign (20.), or written out (twenty dollars). Our motivation to test these price formats stemmed from our work with restaurant managers and other food and beverage operators who were charged with designing or updating their restaurants' menus. Operators describe internal debates about what items to include on a menu, and how those items should be priced to maximize profitability. These discussions were fairly rational and were based loosely on traditional strategies, such as pricing to maximize contribution margin or marketing an item position to encourage trade-up or trade-down.

However, we were surprised to find that when the topic turned to a menu's design and the presentation of its content, the discussion quickly became less reasoned and more emotional. A typical comment might be: "I think the menu looks better if we write out the prices instead of using numbers. Dollar signs look cheap and tacky." This study was conducted with the hope of providing practitioners with empirically proven guidance on what price presentation tactics might encourage higher sales. In that vein, we chose to test the three price formats that we mentioned above, all of which are commonly seen on restaurant menus.

We first discuss interdisciplinary sources of published research that influenced our thinking about menu design and its impact on customer behavior, and then we present the results of a study we performed on menu price presentation. Finally, we conclude with a discussion of implications for restaurant operators.

Background

Existing hospitality management research suggests that consumers' purchase behavior and their value and quality assessments can be affected by the way menu items are presented, that is, by labeling or descriptions. In a test involving menus at a college faculty cafeteria, Wansink and his colleagues found that descriptive labels can increase an item's purchase frequency as well as consumers' satis-

faction towards the purchase.[3] However, the increase in satisfaction was not reflected in an increased willingness to pay. For example, test subjects were both more satisfied with and believed they got more value from their purchase of "Grandma's Zucchini Cookies" than they were with just "zucchini cookies" (although the two products were identical). But the same subjects were not willing to pay more for Grandma's Zucchini Cookies than they would pay for the plain zucchini cookies. Technically, the consumer wasn't presented with any additional information about the cookies (outside of the fanciful labeling). Surely grandma was not actually in the restaurant kitchen baking the cookies. Yet reading "Grandma's" on the label clearly affected the respondents in this study. Thus, Wansink's study showed that customers' attitudes can be affected by the way an item is presented on a menu.

Other research also indicates that the attitude of value-oriented guests may be influenced by odd-numbered or "value" price presentations.[4] For example, Naipaul and Parsa found that guests perceived a quick-service menu to be more value oriented when its prices ended in 9 than when the prices ended in 0.[5] In the same study, fine dining establishments were thought to be of higher quality when their menu prices ended with 0 than when the prices ended with 9. The suppositions in these two findings are that the numeral 0 conveyed quality in fine dining, while the number 9 conveyed value in quick service. But again, this relationship between price presentation and perception was tested in the context of attitudes, not purchase behavior.

For food purchase behavior precedents, we turn to studies conducted in supermarket settings. Research in this arena suggests that price presentation differences based on positioning, size, or use of symbols can affect purchase behavior (not just perception) of non-price-conscious consumers.[6] In a nutshell, Miyazaki *et al.* wanted to see whether the way unit price labels were presented would change purchase behavior, and, in fact, it did. The Miyazaki study provided two important pieces of empirical evidence for the discussion on price presentation: First, the more prominently unit price information is presented, the more aware consumers were of the price, and the more likely they were to use the price information in their purchase decisions. Second, the relationship between presentation, awareness, and purchase behavior was much less effective with consumers who were already acutely aware of prices—regardless of how prominently the price was presented. Based on these findings, it is reasonable to assume that there is potential to change purchase behavior according to how prominently a price is presented, but that the effect is moderated by how price conscious the consumer already is. Tightwads and penny-pinchers are already actively looking for ways to spend less. It is the behavior of the spendthrifts and casual consumers that we might be able to sway.

Restaurant menus employ a wide variety of price formats, but we examined three of them, namely: numerals with a dollar sign ($20.00), numerals without a dollar sign (20.), and spelled out in text (twenty dollars). Research shows that people process Arabic numerals and their written-word counterparts in much the same way.[7] However, numerical price presentations may carry differences in what social psychologists call semantic salience.[8] That is to say, although the semantic meaning underlying each price presentation is the same (i.e., $20.00 = 20. = twenty dollars), the differences in salience imply that various presentation styles may generate different levels of attention, awareness, and attitude in some consumers. In a sense, it should not really matter how we say it (in the end, the menu item still costs twenty dollars), but customers will notice, remember, and dwell on prices differently depending on how they are stated.

Kim and Kachersky proposed that Arabic numerals may draw more attention in situations in which people have to compute totals.[9] So, for example, although the mind processes the physical count of "20" and "twenty" in much the same way, a "20" presentation on a restaurant menu may more readily stick in a consumer's mind if the person approaches the menu trying to calculate out how much an entire meal is going to cost. This increased awareness, a reminder of payment and cost, may activate what Zellermayer referred to as the "pain of paying."[10] In essence, the pain of paying involves a consumer's reliance on an immediate gut reaction to evaluate whether a product's immediate (not anticipated) pleasure is worth its immediate pain. When immediate pain is greater

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[3] B. Wansink, J. Painter, and K. Van Ittersum, "Descriptive Menu Labels' Effect on Sales," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 42, No. 6 (2001), pp. 68-72.

[4] J. Carmin and G.X. Norkus, "Pricing Strategies for Menus: Magic or Myth?," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 31, No. 3 (1990), p. 44.

[5] S. Naipaul and H.G. Parsa, "Menu-price Endings That Communicate Value and Quality," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 42, No. 1 (2001), p. 26.

[6] A.D. Miyazaki, D.E. Sprott, and K.C. Manning, "Unit Prices on Retail Shelf Labels: An Assessment of Information Prominence," *Journal of Retailing*, Vol. 76, No. 1 (2000), pp. 93-112.

[7] S. Dehaene and R. Akhavein, "Attention, Automaticity, and Levels of Representation in Number Processing," *Journal of Experimental Psychology: Learning, Memory & Cognition,* Vol. 21, No. 2 (1995), p. 314.

[8] Hyeong Min Kim and L. Kachersky, "Dimensions of Price Salience: A Conceptual Framework for Perceptions of Multi-dimensional Prices," *Journal of Product and Brand Management,* Vol. 15, No. 2 (2006), pp. 139-147.

[9] *Ibid.*

[10] Ofer Zellermayer, "The Pain of Paying" (unpublished dissertation), Department of Social and Decision Sciences, Carnegie Mellon University, Pittsburgh, 1996.

Unexpectedly, the largest total checks came from menus that used numerals only and did not mention dollars, either with a word or with a symbol.

than immediate pleasure, then the product being evaluated is less likely to be purchased. With this in mind, our study was conducted with the expectation that:

H1: Menus that use numerical price formats will result in lower consumer spending than those that spell their prices out in script. (Thus, spending with "$20.00" and "20." formats will be lower than spending with a "twenty dollars" format).

Aside from the script versus Arabic numeral difference in presentation, research in cognitive psychology has shown that behaviors and attitudes can be altered subconsciously through priming. In general, priming refers to the idea that attitudes can be subliminally awakened or biased by the presence of some relevant cue. For example, research has shown that pictures or words can make people more culturally or socially biased or change their mood, and that icons such as flags can make people more patriotic—all without a person's conscious awareness that his or her attitudes have been affected.[11] Though little research has been conducted on the behavioral impact of priming with monetary symbols, the presence of a strong, culturally salient icon such as the dollar sign ($) may not only increase price salience, but it may also activate a "pain of payment" reaction by the consumer. Thus we also hypothesized:

H2: Menus that present prices with a "$" symbol will yield lower spending than those that do not.

Methods

The experiment was designed and executed in St. Andrews Café, an upscale-casual restaurant at the Culinary Institute of America (CIA) in Hyde Park, New York. The St. Andrews dining room is operated by the CIA's fourth-semester associate's degree program students under the supervision of a faculty *maître d'*. The restaurant's guest demographics include a wide array of tourists, local businesspersons, and friends and family of the CIA's students, alumni, and administrators. Although guests were not informed of the purpose of the study, they were told that data collected from the study would contribute to the students' educational experience.

From August 6 to November 19, 2007, the St. Andrews lunch meal period used three versions of its typical daily menu. Each of the three menu versions was identical in content. However, they differed in both price presentation format and the color of the elastic binding used to secure the menu cover. Each menu comprised a single landscape-printed 8.5" x 11" sheet folded in half to create two 5.5" x 8.5" facing pages. The paper sheet was banded to a glossy card-stock cover with an elastic band in one of three colors (white, green, or red) depending on the menu format treatment applied. Thus, the table servers knew which menu type they were handing out. (Menus with prices presented in a dollar-sign format were banded with green elastic, those with a numeral-only price format were banded with white elastic, and the ones with a spelled-out or scripted price format were banded with red elastic.) Although there is a significant body of literature that suggests different colors elicit different moods and emotions, we do not believe our use of red, green, and white elastic bands significantly influenced guests' decisions within the context of our study.

Lunch parties who patronized St. Andrews during the experiment period were randomly assigned a menu treatment. Each member of a particular party received the same menu treatment, and thus the unit of analysis used for the experiment was a table (total check). At the end of each meal, but before the check was presented, each party was asked to complete a survey that was coded to refer back to that table's check data via the Culinary Institute's MICROS point-of-sale system (POS). Data collected from the POS included: total check (with and without tax and tip), party size, and dining duration. Of the 256 completed surveys collected, 55 (or 21%) showed discrepancies between the server's recorded guest count for the table, and the guest count recorded in the POS system. These surveys were discarded and the data

[11] P.G. Devine, "Stereotypes and Prejudice: Their Automatic and Controlled Components," *Journal of Personality and Social Psychology,* Vol. 56, No. 1 (1989), pp. 5-18; P.H. Blaney, "Affect and Memory: A Review," *Psychological Bulletin,* Vol. 99 (1986), pp. 229-246; and Y.Y. Hong, M.W. Morris, C.Y. Chiu, and V. Benet-Martinez, "Multicultural Minds: A Dynamic Constructivist Approach to Culture and Cognition," *American Psychologist,* Vol. 55, No. 7 (2000), pp. 709-720.

Exhibit 1

Effect on total check (sales) for operational variables and menu formats

Operational Variable		Est. Effect on Total Check		Standard Error
Intercept	$	(36.95)	*	6.63
Party Size	$	16.28	*	1.81
Dining Duration (Minutes)	$	0.46	*	0.06
Tip Amount†	$	0.94	*	0.21
(# In Party - 3) x (Dining Duration (Min)- 94)	$	0.18	*	0.04
Table (Individual Locations)††				
Price Format				
XX.	$	3.70	**	1.87
$XX.XX	$	(1.85)		1.89
Scripted	$	(1.85)		1.84

* Statistically significant at p<0.0001

** Statistically significant at p<0.05

† Note: In a separate ANOVA analysis, tipping behavior did not vary by menu treatment conditions, that is, menu treatment did not change how much people tipped. F(2,198)<0.38.

†† Three table locations showed statistically significant Total Checks

Note: Adjusted $R^2 = 0.823$.

analysis for this study includes only the 201 samples where party size recorded by both sources matched.

The study design was a between-subjects experiment where total check (both before and after tax and tip) was compared for the three menu-price styles. Data analysis incorporated party size, dining duration, and an interaction term of the two variables to control for party-size effects on total check (just in case people spend more or less depending on their party size). Voluntary tip amount, above the restaurant's ordinary service charge, was also added as a control for general consumer variation in willingness to pay.[12] Finally, we also controlled for variation due to individual table characteristics (such as location and ambience). We then used two statistical techniques, an analysis of covariance (ANCOVA) and a linear contrast, to determine whether price presentation affected total check.[13]

Results

A summary of the ANCOVA regression output is shown in Exhibit 1. The analysis controlled for party size, dining duration, tipping behavior, and individual table variation. Overall, the factors included in this study were able to account for 82.3 percent of the variation observed in how much parties spent. Predictably, party size, dining duration, and guests' willingness to pay (as measured by tipping behavior) helped explain most of total check size ($p < 0.0001$ for each of the three variables). For example, the largest effect seen in the data is fairly intuitive: on average, each person dining in the party increased the average check by $16.28. In addition, the longer the party stayed, the higher the average check (on average, each addition minute of dining duration translated into an additional $0.46 in spending). Some specific table locations also showed moderately different spending levels. ($p < 0.053$).

After controlling for all of the factors mentioned above, the overall price format effect on total check was still not significant. In other words, of all the factors we tracked, differences in how the prices were presented collectively did not really explain why parties spent however much they ended up spending. Statistically, it was clear that the more people there were and the longer they stayed, the more they tipped and the more they spent. The check was affected to a certain extent even by where they sat. All these predicted how much the total check would be. But price presentation in general, did not have any predictive power on total check.

[12] Research suggests that price-sensitive customers use tipping as a mechanism to control cost. Price insensitive guests are usually willing to pay a "premium" by voluntarily tipping more. See: M. Lynn and G. Withiam, "Tipping and Its Alternatives: Business Considerations and Directions for Research," *Journal of Services Marketing*, Vol. 22, No. 4 (2008), p. 328.

[13] Analysis of covariance was used to determine whether the price typography manipulation affected total check. An ANCOVA is a combination of an ordinary regression and an analysis of variance between treatment groups. ANOVA results tell us how different the regression equation looks for each menu treatment. The ANCOVA was then supplemented with linear contrasts between treatment conditions to determine whether significant differences in total check existed between the typographical formats.

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However, the overall regression variable for price format combined all three price formats. Our further analysis has convinced us that the finding that the price format variable was not statistically significant most likely was due to the fact that the three different formats pulled in different directions from each other, as we explain below. Since some menu treatments were associated with higher spending and some related to lower spending, the overall effect makes it look like price format had no effect.

Let's examine the detailed analysis that compares the effects of the three different menu treatments, using linear contrast analysis. Linear contrast allowed us to compare the mean total check for the three price formats, while controlling for the other factors. Through this analysis, we found that parties with the numeral-only format menus spent $3.70 more than the average party at the restaurant, and parties with either dollar-sign format or scripted formats spent $1.85 less than the average party. Summing the absolute value of these differences from average, we calculate a difference of $5.55 in total check ($3.70 + $1.85 = $5.55) between the two formats that had dollar references (either with the dollar sign or with the word written out) and the format that did not. After controlling for the more major predictors of a party's total check, menus that used a numerical price format without specific reference to dollars, yielded an average $5.55 more in spending than menus with prices printed with either a dollar sign or written in script.

Based on average check and party sizes at St. Andrews, this $5.55 increase in total check would translate to about a 8.15 percent increase in average spending per person (from an average $23.00 per person to $24.87 per person). Having made that calculation, we must note that per-person spending was not our unit of analysis. Looking at total check, contrary to our hypotheses, our analysis detected no significant differences between sales for menus with the dollar-sign-and-numeral format and the dollar-scripted format. That is, customers spent essentially the same amount regardless of whether the menu price was presented as, say, $20.00 or twenty dollars.

Discussion

The results of this experiment encourage further research and discussion on menu design and menu psychology. Avenues for future research should include an examination on the priming effects of monetary symbols on purchase behavior. We encourage further experimentation and replication to determine whether our results are truly indicative of a larger psychological phenomenon. Certainly guests perceive the existence of the word "dollars" or the dollar symbol on their menus, but does that perception come with awareness of possible psychological effects? It may also be interesting to examine under what operational conditions menu typography might play a larger role in total spending. For example, this experiment took place during lunch in an upscale-casual restaurant, where consumers had plenty of time, information, and service to aid in the ordering process. In this case, price was only one aspect of the decision making process. The story might be entirely different at dinner, when price might be less (or more) of a factor in ordering decisions. In quick-service or fast-casual environments, where the consumer may be more price conscious to begin with, orders more speedily, and has less service interaction, the decision-making process may put greater weight on price. Significant results in this experiment were only obtained after controlling for a host of operational factors, including guests' willingness to spend.

As much as we might like to believe that we can earn a quick buck by changing the type and presentation of our menus, it is clear that larger operational factors have a much larger impact on purchase behavior than price typography does. Specifically, party size, dining duration, table location, and the consumer's innate willingness to spend all eclipse price typography in affecting the total check size for a party. However, after we controlled for those factors, we did see a significant spending difference for menus that presented prices as numerals only (compared to the other two formats), but we found no spending difference between menus that used numerals with dollar signs and those that used written-out prices. We expected both numerical price formats to activate greater price awareness than did written out prices, resulting in more cautious spending behavior. Consequently, we were surprised that prices presented in the numeral-only format resulted in higher spending than scripted prices did. Perhaps the fact that the word "dollars" was repeated throughout the written-out menu inadvertently primed and activated concepts of cost or price, initiated a pain of paying, and subsequently caused guests to spend less.

The fact that menus which used a dollar sign or the word "dollars" yielded statistically similar spending suggests that consumers interpreted the two formats similarly. It is possible that any potential differences in effect between scripted and dollar-sign formats may have been masked by the presence of monetary cues, whether in text or symbol form. That said, the one price format tested with no specific reference to currency resulted in greater consumer spending. We calculated this at $1.87 more per person (or an 8.15-percent difference), although that figure was not the subject of our statistical tests. Even if that calculation is particular to this restaurant, it's clear that the restaurant's lunch guests reacted differently to the numeral-only presentation. Changing menu typography is easy to do, and there is little downside to formulating a typographical strategy for the menu. Based on our findings here, we conclude that it is better to use a format without any specific references to money. On the other hand, once currency is mentioned, it makes no difference if that monetary reference is a symbol or in words. ■

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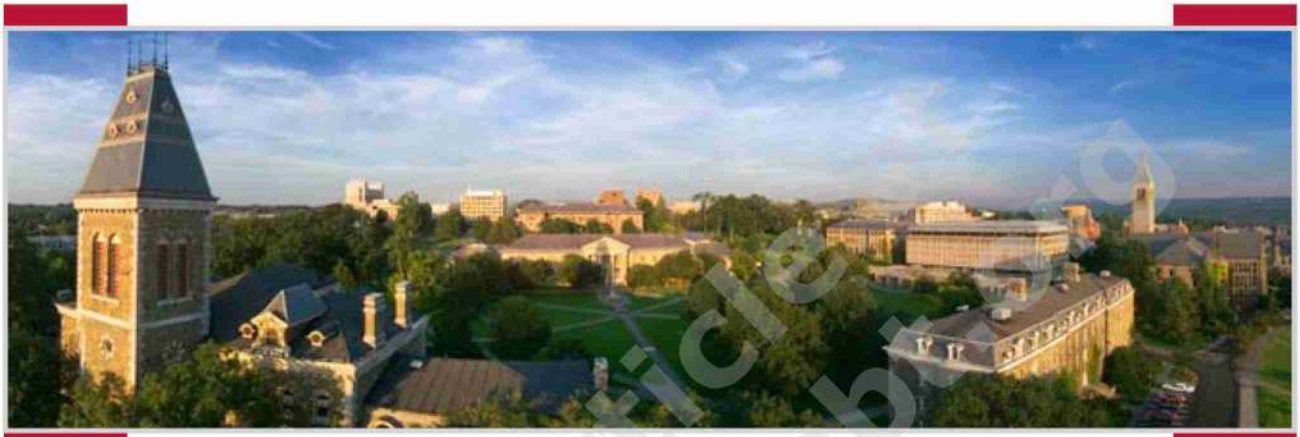

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