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on Sales of Healthy Menu Items**

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ABSTRACT

Although so-called “Heart Healthy” menu items exist, restaurateurs rarely promote them and consumers seem to avoid them. Still, concerns over obesity and poor nutrition have become priority policy issues. This study evaluates the effectiveness of a social marketing campaign in promoting the sale of healthy menu items.

INTRODUCTION

Poor nutrition contributes to four of the ten leading causes of death in the United States, including heart disease, cancer, stroke and diabetes. These diet-related diseases are estimated to cost an estimated \$200 billion each year in terms of lost productivity and medical expenses (1). In California alone, an estimated 35,000 premature deaths and \$15 billion in health care costs every year are linked to poor diet and physical inactivity. Inadequate intake of fruits and vegetables, high total fat intake and high saturated fat intake are believed to be the contributing factors to one-third of all cancer deaths (2, 3).

Changes in the American lifestyle are believed to placing more individuals at risk due to the declining quality of their diets. Currently, Americans eat away from home four to five times per week, spending approximately 45 percent of their food dollars away from home (4). This share is expected to grow to 53 percent by 2010 (5). Unfortunately, these away-from-home meals are typically less healthful than home-cooked foods (2, 6-12), containing more fat and saturated fat and less calcium, fiber and iron and fewer servings of fruits and vegetables (6,7, 11,12). Indeed, some have suggested a link between obesity and eating at restaurants (13, 14). Thus, increased away from home food consumption appears to pose a significant barrier to improving American dietary habits and health.

Several pilot and demonstration projects have attempted to encourage more healthful dining choices (15-25). Evaluations of these campaigns were generally accomplished through surveys of diners and restaurateurs (15, 18-24). While most diners rate nutrition as moderately to very important, evidence indicates that few make menu selections on the basis of health or nutrition (15, 16). More often, taste or perceived taste is the primary factor influencing menu choices (19-20). The effect of these promotion efforts on product sales has been measured in

work-site or university cafeterias (22, 25, 26). However, only a few studies measured the sales effect in commercial restaurant venues. Using data from a chain with four locations collected over a four week period, Albright (18) found that the sale of specially marked healthy menu items might be increased by as much as 40 percent. Similarly, Anderson (22) found an average 41 percent increase in sales of healthy menu items in seven family restaurants and two cafeterias as part of a six-week campaign.

This study reports on the longest and largest scale dietary health, restaurant promotion evaluated using restaurant sales data. The 15-month social marketing campaign, “TrEAT Yourself Well,” was executed in San Diego, California. Four restaurant chains participated in this campaign and provided sales data for store locations in the experimental region (San Diego) and in outlying (control) regions. The principal goals of the campaign and this research were (1) to increase consumer awareness of alternative healthy menu items, (2) to improve consumer views towards healthy menu items, and (3) to increase the sale of healthy menu items. This study focuses on the third goal.

METHODS

Study Design

The research design called for six restaurant chains to provide experimental (intervention) and control locations. Within each chain, two locations in San Diego were selected as experimental locations and either one or two locations outside of the San Diego campaign area, but within California, were selected as controls. Within each chain, the “healthy” menu items were offered and displayed identically on the menus in each of the experimental and control locations. However, the restaurant sites in the experimental area had additional in-restaurant displays and promotional materials and a multifaceted social marketing campaign was

implemented in this region. The participating restaurants were offered advertising and promotion in exchange for cooperation with recipe development or modifications, in-restaurant promotions, and access to sales data during the campaign.

Of the six restaurant chains that initially agreed to participate, two were quick-serve, three were moderately priced family style restaurants (one Mexican, one upscale pizza, one 40s-style diner) and one was a fine-dining Italian restaurant. The corporate marketing managers were asked to assist in selecting the experimental and control locations. The control locations included restaurants in both Northern and Southern California (San Francisco Bay area, Santa Barbara area, and Riverside County). Eventually, noncompliance with the menu and in-store promotional requirements, as well as a failure to deliver appropriate data, led to the elimination of two chains from the study.

In some cases the featured menu items were ones that already met the study criteria (less than 30 percent of calories from fat or less than 20 grams of fat and at least 2 fruit and/or vegetables servings per meal). In other cases the selected “healthy” items required modifications, such as the addition of fruits or vegetables or a reduction in the amount of fat used in preparation. A minimum of six such items were chosen for each restaurant and designated on the menus as “TrEAT Yourself Well” items along with an explanation of the designation.

Social Marketing Campaign

The social marketing program implemented in the greater San Diego area between April 2000 and June 2001 included in-restaurant promotions (table tents and posters), community events (seminars, food tastings, and educational programs), cooperative and direct marketing efforts with health professionals in the community (dietitians, physicians, health educators), and paid media advertising (television and magazine). Additional in-restaurant promotions included

incentives where the wait staff was encouraged to promote the TYW menu items and was paid a bonus for each that was sold.

The promotion efforts also targeted residents in the participating restaurants' market area. Samples of the TYW dishes were offered at neighborhood apartments and businesses. Direct mailings of coupons were made to participating restaurant customers. In addition, a freestanding insert (custom newspaper) promoting the restaurants their healthy menu items was distributed to residents in zip code areas surrounding the experimental restaurant locations. Key influencers, like health professionals, were also targeted in the campaign. Nearly 20,000 color brochures were distributed during the campaign primarily through medical offices. Health professionals were also given gift certificates to the participating restaurants with the implicit expectation that the professionals would promote these restaurants to their patients and clients.

Measurement and Methods of Analysis

Consumer choices over restaurant menu items are guided by the economic factors that condition all consumer decisions: price, price of substitute products, income, and tastes and preferences. Indeed, even the decision to dine out and the selection of the restaurant is influenced by these same theoretical economic factors. Analysis of these issues, though, is beyond the scope of this analysis, as it would require detailed data on individual consumers. Furthermore, the influence of price on menu choices is not evaluated either. During the promotion period, very few price changes were made on the menu items. Even when the restaurant chains instituted short-term promotional prices for some items, this information was not recorded and made available to the researchers. The restaurants, whose identity is not revealed due to confidentiality agreements, did provide information on the total number of entrees sold and the total number of TYW entrées sold over the entire study period, January 2000

through June 2001. Therefore, this analysis focuses on the share of TYW entrées sold at each restaurant and how this share was influenced by the various promotional efforts, which could be theoretically linked to consumer tastes and preferences.

The analysis is performed using a multiple regression model with the dependent variable measuring the share of all entrees (expressed as a percentage) sold at a particular restaurant accounted for by the TYW menu items. The monthly observations on this product category's sales were pooled across the participating restaurants. It was recognized that these sales shares not only varied over time, but also by restaurant chain and restaurant location. For example, in the experimental market, the TYW entrée share in one restaurant averaged 6.43 percent in one chain (referred to as chain D), while it was only 1.61 percent at another (a chain A restaurant). This variation could be due to the characteristics of the chain's customers or other factors related to the restaurant. Therefore, restaurant-specific indicator variables were used to account for those factors that could not be controlled in this market experiment. These variables are set equal to one when the dependent variable corresponds to a particular restaurant and zero otherwise.

Variation in the TYW entrée share is expected across restaurants in the same chain across the two regions. Indeed, this is the central question of this study—did the promotion influence the sale of the TYW items? Casual observation of the data suggests an affirmative response to this question. For example, in one chain (chain D) the average share in the control region is 5.03 percent, while it is 6.43 percent in another. The extent to which this difference is attributable to the social marketing campaign in the experimental market is measured using an indicator variable, which is set equal to one during those months when the campaign was in place when

the dependent variable corresponds to an observation from the experimental market, and zero otherwise.

These considerations suggest the following specification for the regression model:

$$\text{Model 1: } Share_{jt} = f_1(\text{Restaurant}_j, \text{Time trend}, \text{Promotion})$$

$Share_{jt}$ denotes the share of TYW items sold by the j th restaurant in the sample for a given month t ; $Restaurant_j$ denotes the set of restaurant indicator variables, included to control for restaurant specific effects; $Time trend$ is a trend variable ranging from one to 18, corresponding to the months of data in the sample. This variable is included to control for any changes in consumption patterns that evolve over time, which may be unrelated to the campaign.

$Promotion$ is equal to one for experimental restaurants during the promotion period and is equal to zero otherwise. The estimated parameter associated with this variable measures the shift in healthy entree share due to the campaign overall.

However, Model 1 does not incorporate information regarding the elements of the campaign, such as the television and magazine advertisements, special in-restaurant promotional efforts, brochures, gift certificates, an Internet web site, direct mailings, and a custom newspaper. A second model, which includes the independent effect of these variables on the share of TYW entrees can be specified as follows:

$$\text{Model 2: } Share_{jt} = f_2(\text{Restaurant}_j, \text{Time trend}, \text{Promotion}, \text{Wait staff}, \text{Television}, \text{Magazine}, \text{Public relations}, \text{Web hits}, \text{Brochures}, \text{Health certificates}, \text{Restaurant mailings}, \text{Custom newspapers})$$

Note, the promotion indicator variable is retained in this alternative specification. This will control for any remaining promotion activities that still may not be accounted for explicitly by the model.

Analysis of the wait staff incentive program presented some special concerns. The number of rewards granted at each restaurant is available. However, this is only a measure of success and it is directly related to the dependent variable. It would have been preferable to measure the number of recommendations made to customers by the wait staff. Then, a measure of the effectiveness of this personal selling method could be estimated. Therefore, this promotion activity was measured by a binary variable (*Wait staff*), which equals one for the restaurants and months where the program was in place. The estimated coefficient will indicate the extent to which the sale of healthy entree items increased during the implementation of this promotional activity.

The remaining variables in this model are intended to measure the more traditional media and promotional efforts. *Television* measures the number of viewers during the time periods purchased for television advertisements; *Magazine* is a measure of the number of readers of the selected magazine during the months the advertisements were placed; *Public relations* measures the number of readers of newspapers carrying feature articles on the restaurants and their TYW offerings; *Web hits* measures the number of visits to the campaign web site; *Brochures* measures the number of brochures distributed on a monthly basis; *Health provider certificates* measures the number of gift certificates distributed to health providers; *Restaurant mailings* measures the number of flyers mailed directly to restaurant patrons; and *Custom newspaper* measures the number of custom newspapers distributed.

All the model variables are defined in Table 1. Monthly data for the period January 2000 through June 2001 are used in estimating these models. The models are estimated as two-limit tobit models, recognizing that the dependent variable is bound between 0 and 100. In this instance, ordinary least squares would produce inconsistent parameter estimates (27).

RESULTS

Parameter estimates associated with the two regression models are presented in Table 2. Based on the results for Model 1, the share of TYW entrees increased by 0.03 percent per month during the study period. This might reflect consumer experimentation or adoption of the new menu items. The adoption or trial was also aided by the campaign. Specifically, the campaign increased the share of TYW entrees by 0.72 percent in the experimental region. The variability across restaurants is captured by the estimated parameters for the restaurant indicator variables. Although data from 13 restaurant sites over four restaurant chains (Chains A through D) were used in the analysis, only 12 restaurant indicator variables are included in the model. One indicator variable (Chain D, control site) must be excluded to prevent the formation of a singular matrix of independent variables, which would prevent the estimation of the model. This results in the constant measuring the mean share of the excluded category, while the restaurant indicators measure the difference in the mean share for that restaurant site and the excluded site.

The 0.72 percent increase in product sales in the experimental region attributable to the campaign represents the mean affect of the campaign on the intervention restaurants. Obviously, changes in share in excess of this amount are observable and would be expected. Indeed, periodic monthly increases in share of three to four percent are observed in some cases. To develop an understanding of the causes of these changes in share more fully, the model that includes measures of the alternative promotion activities must be evaluated.

When this alternative model is estimated, neither the time trend nor the promotion indicator variables are statistically significant (Table 2; Model 2). This would suggest that the model's new variables account for the effects previously captured by those two variables. Notably, the wait staff incentive program is found to have a significant impact on share.

Specifically, during the months and at the restaurants where this program was in place, the share of TYW entrees increased by 2.98 percent. Given, that the TYW entrees only had an average share of 1.89 percent across all experimental restaurants during the pre-intervention period, this is a substantial change. The success associated with this particular promotion tool might be expected, as personal selling is known to be a very effective promotional activity (28).

In contrast, most of the mass media efforts (television, magazines, and public relations) are not found to have a statistically significant impact on the share of healthy menu items sold in the experimental market. None of the estimated coefficients for these variables representing these activities are significantly different from zero. However, success was found in some of the other promotional efforts.

The campaign brochures, which were distributed through a variety of venues and distribution channels, but primarily through health professionals' offices, were found to have a statistically significant impact on the share of healthy entree items. Indeed, each 1,000 brochures distributed increased share by 0.21 percent. During the 15 months of the campaign, 19,119 brochures were distributed for an average of 1,275 brochures per month.

The certificates given to health professionals, the direct mailings to restaurant patrons, and the custom newspapers (freestanding inserts) also had statistically significant impacts on the TYW product share. Each 1,000 certificates distributed to health professionals increased share by 0.64 percent. Share increased by 0.27 percent per 1,000 restaurant direct mailings and 0.0038 percent per 1,000 customer newspapers. Each of these activities was staged over a one-month period during April and May 2001. Thus, their effect could be viewed as creating a short-term spike in TYW product sales. Using the total number of each distributed, the predicted increase in share generated by the health certificates, restaurant mailings, and custom newspapers is 0.93

percent, 0.91 percent, and 0.92 percent, respectively. While the total impact of each activity on share is about the same, their marginal impacts (the impact per item distributed) are dramatically different and accord well with expectations. The distribution of the certificates to health professionals generates the greatest change in share per unit distributed, followed by the restaurant mailings, and then by the customer newspaper. The health certificates were a very targeted effort and, as such, would be expected to be more effective on a per unit basis. By comparison, the custom newspaper distribution is a less targeted activity.

Whether the increase in share observed for the alternative promotional had a sustained or carry-over effect was the focus of some additional analysis. The carry-over effect of advertising and other promotional activities, whereby advertisements in one month continue to have an effect in subsequent months, is well understood (29). This type of analysis is usually investigated by introducing lagged advertising variables in the estimated model. When this issue was investigated in this study, no significant evidence of a carry over effect was found.

Finally, for each of the effective promotional activities, the cost of achieving the gains in percentage share is investigated. Specifically, the gain in share per dollar spent on the promotional activity is evaluated. This required an estimate of the cost per unit for each promotional activity. For the brochures, health care provider certificates, restaurant mailings, and custom newspapers, the unit costs were computed by summing all the production and distribution costs for each and dividing it by the number of units distributed. For the wait staff incentive, the unit costs are calculated as the average payment in incentives per restaurant per month. Then, the estimated marginal effects for each activity are divided by their respective unit cost. Recall, the marginal effects indicate the percentage change in share associated with a one-unit increase in the promotional activity. Since the number of brochures distributed is measured

in thousands, distributing an additional 1,000 brochures would increase share by 0.21 percent or by 0.00021 percent per brochure. Dividing this per unit marginal effect by the unit cost, will give the change in share associated with each dollar spent on the promotional activity.

Therefore, the share of the TYW entrees increased by 7.9E-4 percent for each dollar spent on brochures. The interpretation is similar for the other printed promotional activities (health care provider certificates, restaurant mailings, and custom newspapers), as shown in table 3.

Since the wait staff incentive is measured by a binary variable equal to one for the months the campaign was in place, the marginal value indicates the percentage share in TYW entrées sold that would be observed at restaurants implementing this activity. This marginal effect is then divided by the average payment in incentives per month to the participating restaurants. This shows that an increase of 1.5E-3 percent for each dollar spent.

All of the gains in share per dollar spent are fairly small. Still, their relative magnitudes can be used to indicate the effectiveness of the activities. By far the greatest gain in share per dollar spent was achieved under the wait staff incentive program. This is followed by the brochures, the health care provider certificates, the restaurant mailings, and, lastly, the custom newspapers.

DISCUSSION

Overall, the campaign increased the share of the TYW items sold by 0.72 percent in the experimental region. Prior to the intervention, the share of TYW items was estimated at 1.89 percent. Thus, the promotion caused an appreciable increase in the share of these more healthful items. Among the various promotional tools, the wait staff incentive program was shown to be particularly effective. Brochures, certificates distributed to health professionals, direct mailings,

and custom newspapers also proved to be effective promotional activities. Television and magazine advertisements and public relations efforts were not effective.

These results suggest that certain promotional activities may encourage diners to eat more healthfully when dining out. However, only short-term changes in dining habits were observed in this study. For instance, the wait staff incentive program produced a dramatic increase in the share of TYW entrées sold. However, these promotions showed no carry-over effect in the following month. In an effort to improve the dietary habits of U.S. consumers, it is essential to find promotional and educational methods that have a lasting impact on consumers that are sustainable policies. It is uncertain whether public health administrators could advocate promotion programs that rely on paying the wait staff of a restaurant to promote more healthful items, especially when the activity does not produce sustained changes in dining habits.

The failure of the promotional activities to have any carry over effect is also a matter of concern to restaurant managers. These managers aspire to offer products that will not only encourage repeat sales, but also attract new customers. These managers have little interest in carrying items on their menu that fail in these terms and have generally overall low sales. Thus, it is incumbent upon public health advocates to find healthy menu items that consumers find appealing, either through research on the products or through greater education of the public.

The importance of educating the dining public should also be emphasized. Although, some the promotions used in this campaign were effective in promoting short-term sales, some of them offered little in terms of new information on diet and health to the consumer. Education is vital to producing long-term changes in dining habits. Therefore, the impact of the brochures and health certificates, which do incorporate a strong health message, is worth emphasizing. The role health care professionals may play as an influencer is supported by existing marketing

strategies, where key opinion leaders are often targeted in grass roots marketing campaigns (30). Future studies on the effectiveness of dietary health promotions should further explore the role grass roots marketing strategies may play.

SUMMARY AND CONCLUSIONS

This study evaluated the effectiveness of the “TrEAT Yourself Well” social marketing campaign, which was intended to encourage restaurant diners to select more healthful menu items that are richer in fruit and vegetable content and lower in fat. Specifically, an item featured by participating restaurants had to have at least two servings of fruits and/or vegetables, and either less than 30 percent of calories from fat or less than 20 gram of fat. This campaign and evaluation was conducted in cooperation with four California restaurant chains. These chains have stores in the experimental region (San Diego, California) and the control region, areas outside of San Diego. Within each chain all restaurant locations offered the same menu items and presented the featured items in an identical manner on their menus. However, restaurants in the San Diego area also had additional in-restaurant promotional material featuring the TrEAT Yourself Well menu items. Other promotional activities in the experimental region included television and magazine advertisements, special newspaper inserts, direct mailings, brochures, public relations efforts, and a wait staff incentive program, through which the wait staff were asked to recommend Treat Yourself Well menu items and paid rewards for each TYW menu item sold. The effectiveness of the campaign and these campaign activities on increasing the share of TYW entrees sold was evaluated in this study using data provided by the chains.

The most effective promotions were the wait staff incentive program, direct mailings to restaurant customer, and gift certificates offered to health professionals. In terms of cost effectiveness, the wait staff incentive program produced the greatest change in share per dollar

spent on the promotion. However, the sustainability of this promotion activity, as a matter of public policy is questionable. The brochures, restaurant mailings, and gift certificates followed the wait staff incentive program. Offering gift certificates to health professionals appears to have other benefits, such as a multiplying effect as they distribute information to their patients and the opportunity to include more educational information.

To develop a better understanding of what types of promotional and educational activities may improve the dietary habits of U.S. dining public, three avenues of future research are suggested. First, if market experiments of the type used here are to be employed, longer study and campaign periods are needed in order to more fully explore the dynamics related to the promotion activities. Second, a better understanding of how consumers respond to messages on healthy dining and consumer perceptions of more healthful menu choices is needed. The still very low share of sales accounted for by these more healthful alternatives suggests weak acceptance by the consumer and/or inadequate understanding of the importance of menu choices. Third, better understanding of restaurant management goals and ways to encourage restaurants to increase the selection of healthy menu items is needed.

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Table 1. Hypothesized Variables Explaining Share of Healthy Product Sales.

Variables	Description	Min	Max
Restaurant _{<i>i</i>}	Set of binary variables; equals 1 for observations corresponding to the <i>i</i> th restaurant in the sample; otherwise 0.	0	1
Time trend	Time trend variable ranging from 1 to 18 corresponding to each month data was collected	1	18
Promotion	Equals 1 for observations in the experimental market during the promotion period	0	1
Wait staff	Binary variable; equals 1 for restaurants and months where incentive program was in place; otherwise 0.	0	1
Television	Number of viewers during time slots purchased for advertisements per month	0	4,620,510
Magazine	Number of subscribers during months of printed ads	0	47,236
Public Relations	Number of readers for printed articles per month	0	662,312
Web Hits	Number of web hits per month	0	3,578
Brochures	Number of brochures in thousands distributed per month	0	3.64
Health certificates	Number of certificates in thousands delivered to health providers per month	0	1.38
Restaurant mailings	Number of direct mailings in thousands sent to restaurant patrons per month	0	2.08
Custom newspapers	Number of custom newspapers in thousands distributed per month	0	236.22

Table 2. Marginal Effects of the Promotional Activities on the Share of TYW Entrees Sold.

Independent Variable	Model 1	Model 2
Constant	4.73** (20.51)	4.91** (29.83)
Time	0.03** (2.49)	0.01 (1.10)
Promotion	0.72** (3.18)	-4.78E-4 (-2.00E-4)
Wait staff incentive		2.98** (12.54)
Television		-1.62E-08 (-0.22)
Magazine		4.05E-07 (0.08)
Public relations		1.07E-07 (0.24)
Web hits		1.06E-04 (1.51)
Brochures		0.21** (2.66)
Health certificates		0.64** (2.20)
Restaurant mailings		0.27** (2.05)
Custom newspaper		3.81E-3** (3.12)
Restaurant _{A1} (<i>Experimental</i>)	-3.91** (-11.32)	-3.73** (-15.55)
Restaurant _{A2} (<i>Experimental</i>)	-4.07** (-11.76)	-3.89** (-16.19)
Restaurant _{A3} (<i>Control</i>)	-2.99** (-10.34)	-3.00** (-15.03)
Restaurant _{A4} (<i>Control</i>)	-4.03** (-13.90)	-4.03** (-20.21)
Restaurant _{B1} (<i>Experimental</i>)	-1.54** (-4.46)	-1.64** (-6.85)
Restaurant _{B2} (<i>Experimental</i>)	-1.52** (-4.40)	-1.62** (-6.76)
Restaurant _{B3} (<i>Control</i>)	-2.13** (-7.34)	-2.13** (-10.68)

Table 2. Continued next page

Table 2. Continued.

Independent Variable	Model 1	Model 2
Restaurant _{C1} (<i>Experimental</i>)	-3.59** (-10.38)	-3.95** (-16.47)
Restaurant _{C2} (<i>Experimental</i>)	-4.46** (-12.90)	-4.66** (-19.46)
Restaurant _{C3} (<i>Control</i>)	-4.80** (-16.56)	-4.81** (-24.08)
Restaurant _{C4} (<i>Control</i>)	-4.71** (-16.25)	-4.72** (-23.63)
Restaurant _{D1} (<i>Experimental</i>)	1.42** (4.92)	1.01** (4.21)

The values in parentheses are asymptotic t-values. Two and one asterisks (** and *) denote significance at the five and ten percent levels respectively.

Table 3. Gains in Share per Dollar Spent on Promotional Activity

Promotion Activity	Cost	Marginal Effect	Gain in Share per Dollar Spent
Wait staff Incentive	\$1,955.00/restaurant/month	2.98	1.5E-03
Brochures	\$0.27 / unit	0.21	7.9E-04
Health Certificates	\$1.14/ unit	0.64	5.6E-04
Restaurant Mailings	\$0.50/ unit	0.27	5.4E-04
Custom Newspaper	\$0.23 / unit	3.81E-03	1.6E-05