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PROMPTING ONE LOW-FAT, HIGH-FIBER SELECTION IN A FAST-FOOD RESTAURANT

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Evidence increasingly links a high-fat, low-fiber diet to coronary heart disease and certain site cancers, indicating a need for large-scale dietary change. Studies showing the effectiveness of particular procedures in specific settings are important at this point. The present study, using an A-B-A-B design and sales data from computerized cash registers, replicated and extended previous work by showing that inexpensive prompts (i.e., signs and fliers) in a national fast-food restaurant could increase the sales of salads, a low-fat, high-fiber menu selection. Suggestions also are made pertinent to more widespread use of the procedures.

DESCRIPTORS: health, nutrition, prompting

The relationship between high levels of dietary fat and coronary heart disease has been well documented (Cummings, 1986). More recently, emerging evidence has also shown a strong link between high-fat, low-fiber diets and certain site cancers (Greenwald, Sondik, & Lynch, 1986). In fact, Greenwald et al. concluded that dietary factors may account for 25% to 35% of cancer mortality. Thus, dietary modification to decrease fat and increase fiber may help to lower the risk of coronary disease and cancer.

Community health promotion has offered one of the most promising approaches to large-scale dietary change. These programs have often combined prompting (e.g., Dubbert, Johnson, Schlundt, & Montague, 1984), mass media, and other strategies (e.g., Farquhar et al., 1985) in sustained campaigns. However, with only a few exceptions (e.g., LeFebvre et al., 1986), these large-scale efforts have not sufficiently tested individual procedures in specific settings. Further, it is unlikely that complicated and expensive programs will be routinely replicated (Light, 1986). Thus, smaller scale efforts that investigate highly specific and potentially efficacious dietary change procedures in particular settings are valuable at this point.

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Given the high rate of dining out in the United States (Brownell, 1986), cafeterias and fast-food restaurants are optimal intervention sites. Dubbert et al. (1984) used labelling and prompting strategies to increase sales of low-calorie items in cafeterias. Mayer et al. (1986) used point-of-choice prompts and fliers in a public cafeteria to increase sales of low-fat entree choices. The Mayer et al. (1986) intervention followed a number of guidelines for prompts (i.e., specify desirable, convenient behaviors using polite language, with the prompt in close proximity to the target behavior; Geller, Winett, & Everett, 1982) and used pilot research for construction and placement of the prompts (Mayer, personal communication, October, 1986).

The present study was a replication and extension of the study of Mayer et al. (1986). Based on our own formative and pilot research, prompts were developed for a national chain fast-food restaurant. The objective was to promote one low-fat, high-fiber menu item selection (salads) without undermining the sales of other menu items.

METHOD

Subjects and Setting

This study was conducted in two national fast-food restaurants located in Blacksburg, Virginia, and Radford, Virginia. The Radford restaurant provided no-treatment comparison data. In Blacksburg, approximately 30% to 35% of the clientele were university-related (Virginia Polytechnic Insti-

tute and State University) customers; in Radford, approximately 20% of the clientele were university-related (Radford University) customers.

Materials

The intervention was directed toward influencing customers to choose a salad (side salad or salad bar) through a simple visual message presented with prompts located in several places in the restaurant. Two large (45 cm by 47 cm) colorful posters with the message "Be Fit & Healthy; Eat a low-fat SALAD as your meal or add a side salad" and a picture of a salad were situated near the cash register, where customers placed their orders. Small (10 cm by 12 cm) table tent cards with the same message as the posters were put on each table. A banner and decorative streamer bows with the message "Eat Salads" were placed near the entrance.

The appropriate themes and content were based on surveys and interviews conducted with the target population in Blacksburg 2 months prior to the study. Pilot studies were used to determine optimal poster location.

Dependent Variable

The major dependent measure was based on the computerized cash register system at both sites. Each item purchased by a customer was entered at the cash register by an employee. For each day, management calculated a percentage of total sales represented by each item (actual numbers of menu items sold are proprietary information). In addition, to correct for weather and customer flow, a correction system similar to that used in other consumer research was designed (e.g., Winett, Leckliter, Chinn, Stahl, & Love, 1985). This measure, the "corrected percentage of total sales of the item" was determined by (a) dividing a given day's percentage of sales of the item in Blacksburg by the overall baseline percentage of sales of the item in Blacksburg, and (b) dividing a given day's percentage of sales of the item in Radford by the overall baseline percentage of sales of the item in Radford; the Blacksburg number was then divided by the Radford number, and this figure was multiplied by 100. For example, if the day's percentage of salad sales at Blacksburg was 8.0%, the baseline percentage of salad sales at Blacksburg was 7.2%, the day's percentage of salad sales at Radford was 6.2%, and the baseline percentage of salad sales at Radford was 6.0%, then $[(8.0/7.2) \div (6.2/6.0)] \times 100\% = 108\%$.

Design and Procedures

An A-B-A-B design was used in Blacksburg, with the addition of the no-treatment comparison site in Radford. During these phases, daily sales data were collected. The phases were:

Baseline. No prompts were in place during the first baseline. This phase was conducted for 3 weeks.

Prompting salads. Intervention consisted of placing the prompts at the entrance and near the cash register and placing the tent cards on the tables. This phase was conducted for 3 weeks.

Baseline. During the second baseline, all intervention materials were removed from the restaurant. This phase was conducted for 1 week.

Prompting salads. During the second intervention, materials and positions were identical to the first intervention. This phase was conducted for 1 week.

Follow-up. No prompts were used in the follow-up phase. This phase was conducted 1 month after the last prompting salads phase. Only weekly data were obtained during the 3 weeks of this phase.

The menu remained the same across all phases of the study. The menu was identical in both locations and was identical for both lunch and dinner. Prices, in-store advertisements, and other promotions (e.g., coupons) were also identical in both locations.

RESULTS

Figures 1, 2, and 3 show the corrected percentage of sales at Blacksburg for total salad, salad bar, and side salad selections, respectively. Data were collected daily across phases and weekly during follow-up. Examination of Figure 1 indicates a particularly strong initial effect during the first intervention, a decline in sales after 7 to 10 days of prompting, an increase in sales at the end of the

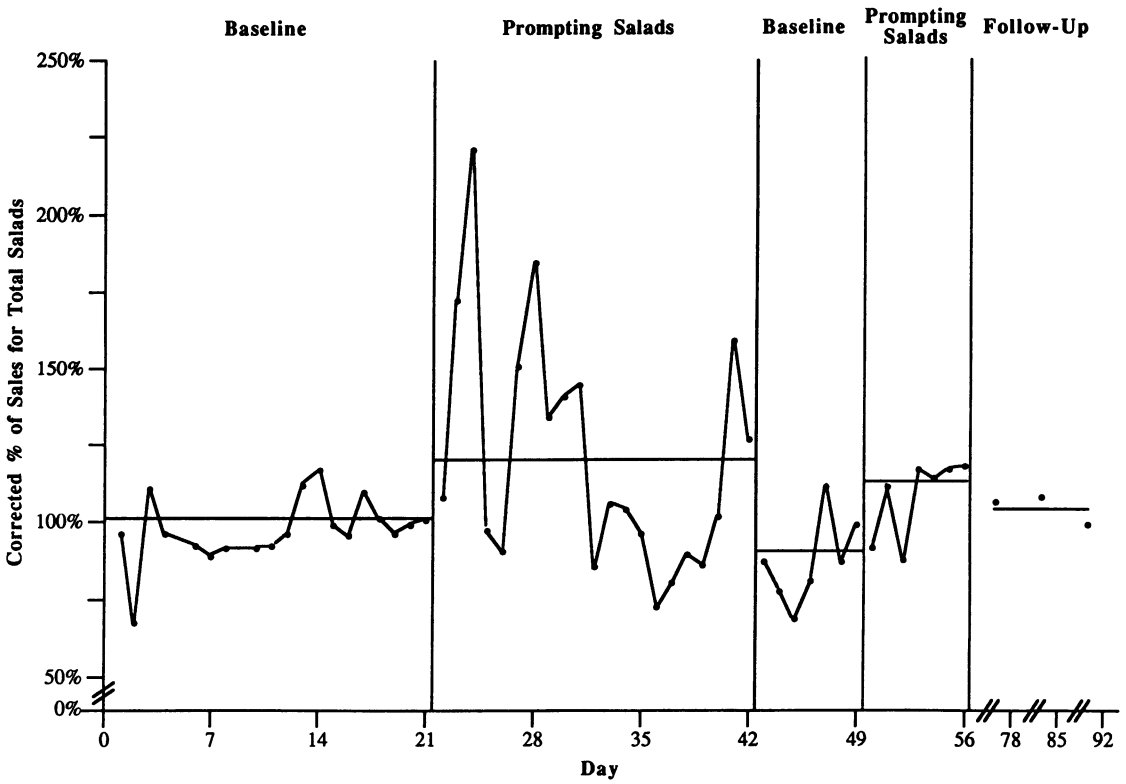

Figure 1. Daily corrected percentage of sales for total salads across phases of the study with weekly follow-up points.

first intervention, a drop in sales during the second baseline, a recovery in sales during the second intervention, and a decline in sales during follow-up. For total salad sales, mean corrected percentage of sales was 100% in the first baseline, 115% during the first intervention, 90% during the second baseline, 109% during the second intervention phase, and 99% during follow-up.

The salad bar sales data reflect a similar pattern (see Figure 2). Increases in sales are shown during both intervention phases. Sales during follow-up are similar to sales during the initial baseline phase. Examination of Figure 3 indicates a pattern similar to Figure 1; increases in side salad sales are seen during both intervention phases, and decreases in sales are seen during the baseline and follow-up phases.

Corrected percentages for single hamburger sales are shown in Figure 4. Consistent increases in sales with prompts are not evident. Mean corrected percentages for single hamburgers were 100% in the first baseline, 103% during the first intervention, 100% during the second baseline, 66% during the second intervention, and 85% during follow-up.

The mean percentages (uncorrected) of sales of the salad bar and side salad selections for Blacksburg (the intervention site) and Radford (the no-treatment comparison site) across phases of the study are shown in Table 1. Examination of the table indicates that average salad bar sales usually increased across time and that during the two baseline phases, sales averaged 5.25% at Blacksburg and 4.6% at Radford. During the two intervention phases, sales increased to an average of 5.6% at Blacksburg and remained at an average of 4.6% at Radford. During follow-up, salad bar sales averaged 6.3% in Blacksburg and 5.6% in Radford.

Side salads showed a less consistent ascending trend. Side salad (uncorrected) sales during the two baseline phases averaged 2.4% in Blacksburg and 2.1% in Radford. During the two intervention phases at Blacksburg, side salad sales increased to

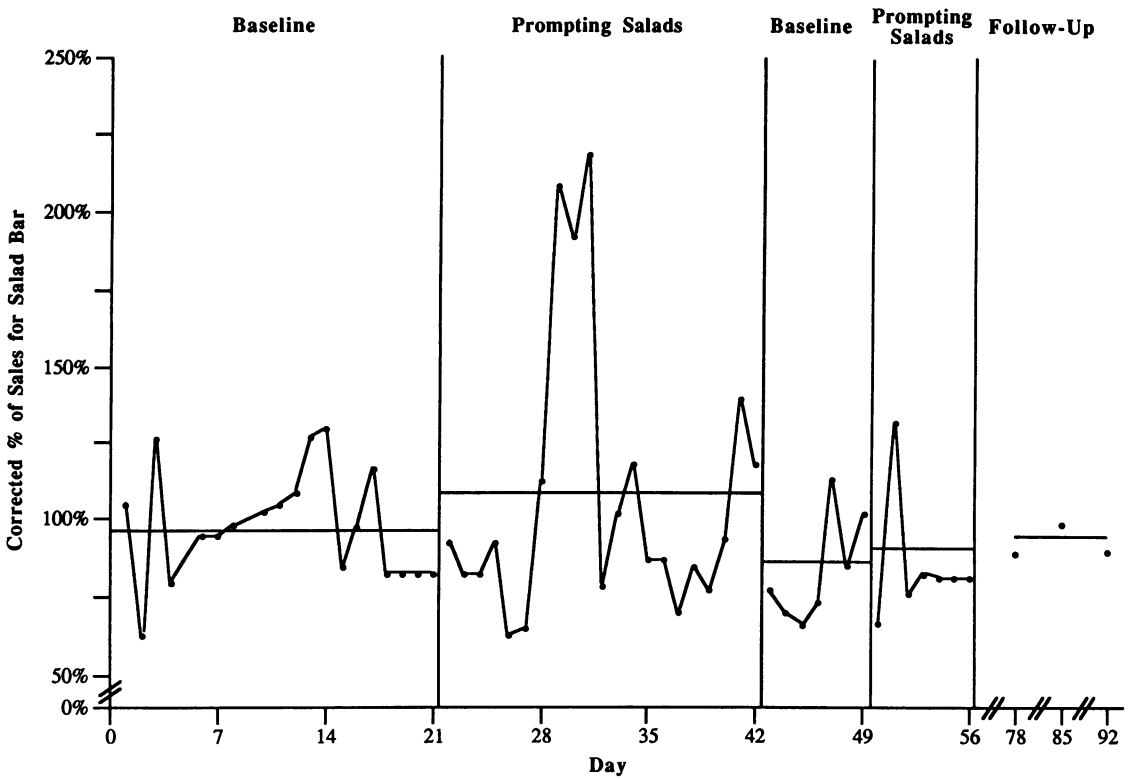

Figure 2. Daily corrected percentage of sales for salad bar across phases of the study with weekly follow-up points.

an average of 2.85%, and at Radford they decreased to an average of 1.7%. During follow-up, side salad sales averages increased to 3.1% in Blacksburg but also increased to 2.7% in Radford.

Table 2 shows the (uncorrected) percentage of sales across phases for the single hamburger. During the two baseline phases, single hamburger sales averaged 14.45% at Blacksburg and 13.5% at Radford. During intervention, single hamburger sales decreased to an average of 13.5% at Blacksburg but increased to an average of 15.7% at Radford. During follow-up, single hamburger sales averaged 14.1% in Blacksburg and 15.5% in Radford.

A cost analysis considering only the cost of the prompting materials ($215) was also conducted. The mean corrected increase in total salad sales during the four intervention weeks was 13.5%. Therefore, during intervention, each percentage point increase in total salad sales cost about $16 ($215/13.5). Management also indicated that, based on customer flow and sales data, they estimated that during the four intervention weeks 980 extra salads were bought by customers. Thus, each extra salad bought required an expenditure of about $.22 ($215/980). Because most increases were noted in side salads (see Table 1 and Figure 3), a $.22 expenditure returned $1.38 (the price of a side salad) to the restaurant.

DISCUSSION

The overall results of the study show that the introduction of relatively inexpensive prompts resulted in an increase in salad sales in the fast-food restaurant. These findings are bolstered by the use of the computerized data entry system and the comparison site data. In this study, on-site observers were not necessary. However, by relying on the computerized data system, purchases of individual customers could not be monitored. From a health promotion perspective, this is an important missing piece of data. For example, if a lean customer

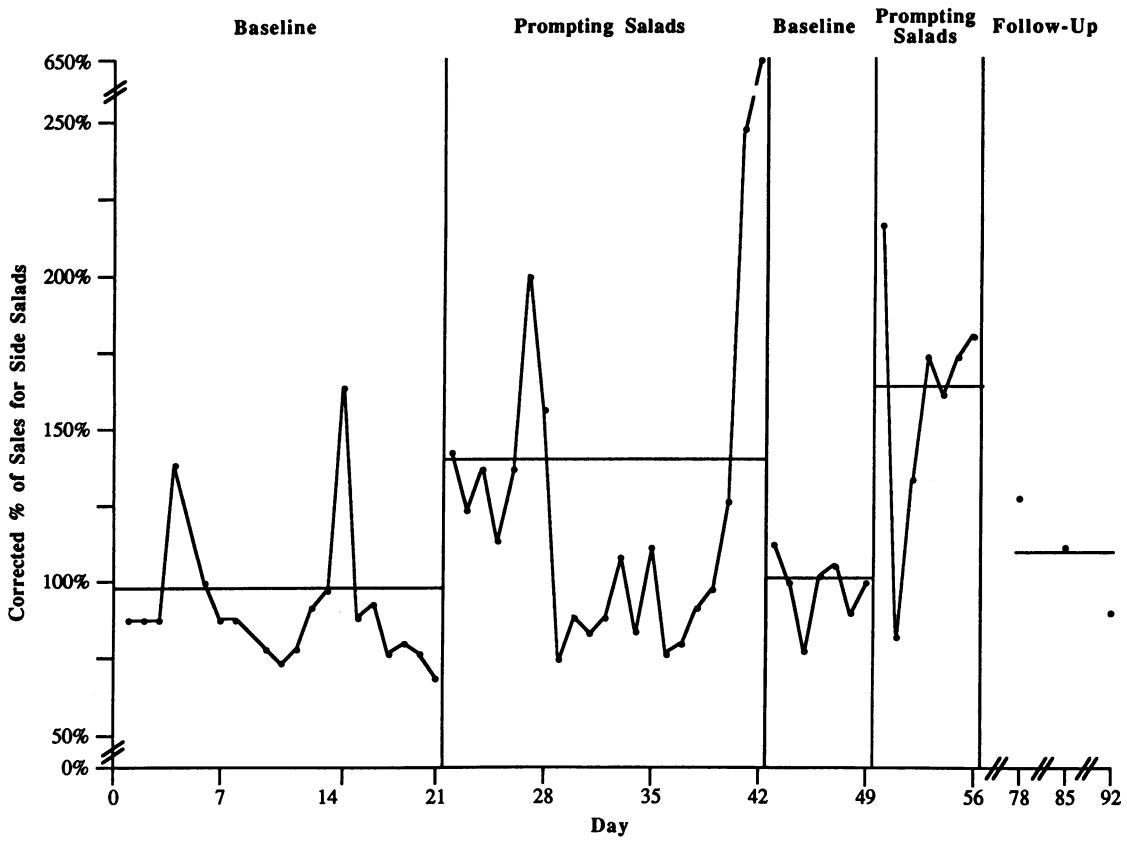

Figure 3. Daily corrected percentage of sales for side salads across phases of the study with weekly follow-up points.

ordered a side salad to accompany a low-fat, high-fiber entree selection, this would be far less important than for an overweight customer to substitute a salad for a high-calorie selection.

Although salad sales varied with the presence and withdrawal of the prompts, it was apparent that prompting effects were relatively transient. An exception to this point was the increase in salad sales at the *end* of the first intervention, an increase for which we do not have a ready explanation.

It was also apparent that side salad sales were affected more than salad bar sales. Side salads usually represent an addition to a meal, not a substitution, whereas a salad bar selection may represent a meal selection substitute. In any case, if customers used high-fat, high-calorie dressings on their side salads, the intervention could have had the unintended effect of increasing fat and calories in customers' meals. A similar effect would arise if prompts increased the purchase of baked potatoes as an alternative meal selection, but customers drenched their potatoes with sour cream or other high-calorie additions. Future projects should monitor meal composition and additions, as well as provide instructive prompts and low-calorie additions (e.g., low-calorie salad dressings, low-fat yogurt).

Single hamburger sales, which were not part of the prompting intervention, decreased in Blacksburg during the second intervention and follow-up. However, these data do not indicate a shift away from the usual high-calorie, high-fat selections. Restaurant management reported that the decline in single hamburger selections in Blacksburg was offset by an increase in the sales of other hamburger selections. In addition, management reported the sales of french fries remained stable at about 12% throughout the study.

The simple cost analysis of this study is also

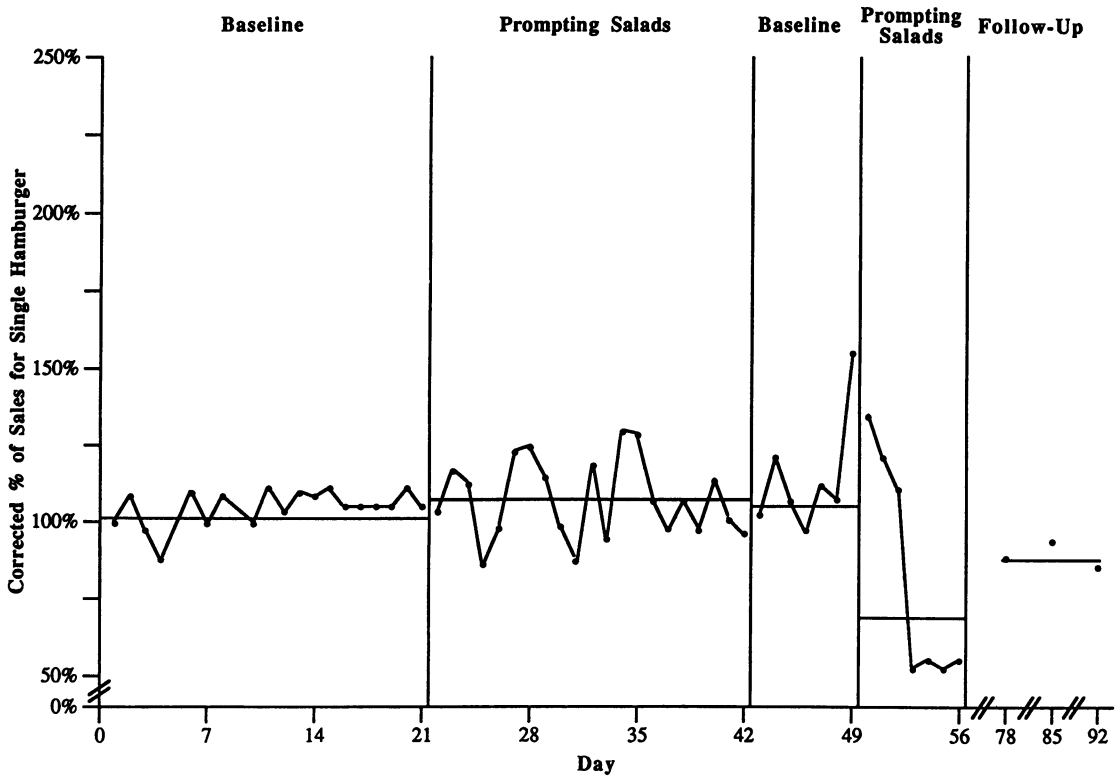

Figure 4. Daily corrected percentage of sales for single hamburger across phases of the study with weekly follow-up points.

important. Results of the analysis indicate that corporations promoting more nutritious purchases may, in some instances, be able to profit from such efforts. This is an important consideration for large-scale dissemination of health promotion strategies.

Several other points should be addressed in future research, including (a) disaggregating the effects of the overall content, theme, and picture in the prompt from, for example, its strategic placement (i.e., the prompt messages for this intervention took considerable effort to obtain from surveys and other research, but may not be necessary to produce change); (b) designing an approach to encourage customers to change predetermined choices (e.g., "*Reconsider*—Try a Healthy Choice"); (c) replicating effects across different settings and populations; (d) designing strategies to demonstrate long-term impact (e.g., a revolving series of messages and prompts); (e) evaluating the effects of a more comprehensive campaign (e.g., discount cou-

Table 1
Mean Percentage (Uncorrected) of Sales of Salad Bar and Side Salad Items Across Phases for Blacksburg and Radford

		Phase of intervention				
Item	Site	B-1	I-1	B-2	I-2	Follow-up
Salad bar	Blacksburg	5.1	5.1	5.4	6.1	6.3
	Radford	4.1	3.8	5.1	5.4	5.6
Side salad	Blacksburg	2.1	2.8	2.7	2.9	3.1
	Radford	1.9	1.8	2.3	1.6	2.7

Table 2
Mean Percentage (Uncorrected) of Sales of Single Hamburger Items Across Phases for Blacksburg and Radford

Item	Site	Phase of intervention				
		B-1	I-1	B-2	I-2	Follow-up
Single hamburger	Blacksburg	15.2	13.5	13.7	13.5	14.1
	Radford	14.2	12.2	12.8	19.2	15.5

pons and in-store prompts); and (f) evaluating short- and long-term health impacts of altered meal selections.

As demonstrated in the present study, the promise of future research is to delineate simple, inexpensive procedures that can influence many customers at the site of consumption to make healthier food choices.

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