

Promoting One Low-fat, High-fiber Choice in a Fast-food
Restaurant: Use of Point-of-Purchase Prompts

by

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Literature Review

Nutrition and Disease

Nutrition has recently become a topic of great interest to individuals working in the health promotion/disease prevention area. The Surgeon General indicates that lifestyle is responsible for approximately 50% of all deaths (Robinson, 1984). One of the major factors contributing to this statistic is the typical American diet. Even though Americans eat a sufficient number of calories, over fifty percent of them eat diets deficient in the necessary proportions of protein, carbohydrates, fats, vitamins and minerals and thus are malnourished (Jeffrey, McLellan & Fox, 1982). The quantity of foods consumed is high, although the quality is low. Therefore, in industrialized countries, we find a malnourishment of excess rather than deficiency.

The typical American diet derives fifteen percent of its calories from sucrose and forty percent of its calories from fat (Jeffrey et. al., 1982). There is also some indication that the American diet includes a high intake of sodium (Abraham & Carroll, 1981) and a less than adequate amount of fiber (Bender & Bender, 1982). The National Health and Nutrition Exam Survey, given to 132 million U.S. adults (Block, Dresser, Hartman & Carroll, 1985) noted that while there was some dietary variability by regions, there was not great variability of foods by demographic groups.

One conclusion from the data from Block et al. is that while, perhaps, diet has changed in recent years in certain population segments, across the entire U.S. most individuals consume a high-fat, high-meat, low-complex carbohydrate, high-simple sugar diet. Additional surveys and monitoring of food purchases across demographic samples have substantiated this position (e.g., Winett, Kramer, Walker, Malone & Lane, 1986).

Because of changes in production (e.g., more processing of foods) and distribution (e.g., the rise of fast food establishments), most reviewers of dietary changes in North America during the last century conclude that from a health-protective perspective, diets have become worse (e.g., Winett, King, Altman, in preparation). Greenwald, Sondik, and Lynch (1986) report the following: (a) fiber intake has declined 20% since 1909, (b) the proportion of calories from carbohydrates has fallen from 56 to 46 % since 1909, (c) the number of calories contributed by sugar has increased, (d) the number of calories from foods rich in fiber has decreased, and (e) per capita consumption of dietary fat has increased 31%. In addition, the consumption of processed fruit and vegetables has increased, while the consumption of fresh fruits and vegetables has decreased (Greenwald, et al., 1986).

Long term consumption of a diet rich in cholesterol, saturated fats, calories, sugar and salt has been associated with coronary heart disease, hyperlipidaemia, atherosclerosis, diverticular disease, various types of cancer, obesity and dental decay (Bender & Bender, 1982; Hamburg, Elliott & Parron, 1982). Although data indicate about a 30% decline during the last 20 years in mortality from cardiovascular and coronary heart disease (CVD and CHD, respectively), these diseases remain the number one cause of premature death and the number one contributor to health care costs in the United States and other industrialized countries (Matarazzo, 1984).

Coronary Heart Disease. Ischaemic heart disease (IHD) is the most common cause of death in middle aged men in all western countries. IHD accounts for fifty percent of all male deaths in the 45-64 age group and is becoming a leading cause of death in the 35-44 age group (Bender & Bender, 1982). In the United States, heart attacks claimed 642,719 lives in 1975 (Meyer, McAlister, Maccoby & Farquhar, 1980). Risk factors associated with heart disease are cigarette smoking, hypertension, and elevated plasma choloesterol (Meyer, et al., 1980). Despite great efforts expended during the last 25 years to control hypertension, the disease frequently remains untreated and infrequently well controlled (about 55% and 24%, respectively, of approximately 30 million hypertensive individuals; Kaplan,

1986). Hubert (1986) also indicated that weight loss in borderline hypertensives can be an effective treatment, while with controlled hypertensives, weight loss may allow withdrawal from drug therapy. Both blood pressure and cholesterol level are strongly influenced by body weight (Blackburn, 1974) and are responsive to changes in diet (Keys, Anderson & Grande, 1965). Dietary guidelines to aid in the prevention of IHD include decreasing saturated fat, sucrose and salt intake and increasing the amount of fiber in the diet (Bender & Bender, 1982). In addition, since a number of medications also pose other risks and side effects (Kaplan, 1986), interest in dietary change is increasing (Winett, et al., in preparation).

Hyperlipidaemia. Hyperlipidaemia refers to the elevation of one or more of the plasma lipids leading to an increase in plasma cholesterol. Hyperlipidaemia may result in long term complication affecting the renal and cardiovascular systems such as atherosclerosis, IHD and peripheral vascular disease (Bender & Bender, 1982). The dietary prescription for prevention of this problem is to restrict fat and cholesterol intake.

Atherosclerosis. Atherosclerosis is an arteriosclerosis characterized by the deposition of fatty substances in and fibrosis of the inner layer of the arteries. A strong body of evidence exists supporting the association between an elevated concentration of

cholesterol in the blood and the progression of this disease (National Heart, Lung & Blood Institute, 1981).

Diverticular Disease. Diverticular disease and other diseases of the bowel are due, in part, to a low intake of dietary fiber. Studies indicate that up to twenty percent of people over forty and seventy percent over seventy in both the U.S. and the U.K. have some evidence of diverticular disease (Bender & Bender, 1982).

Cancer. Cancer caused an estimated 3.5 million deaths in the 1970's, and approximately thirty percent of the American population now living will eventually have cancer (Iammarino & Wienberg, 1985). Researchers have identified diet and nutrition as one of the, if not the most, important area in cancer prevention (Doll & Peto, 1980; Greenwald et al., 1986; Newell & Boutwell, 1980). This is illustrated by a recent statement from the National Cancer Institute professionals:

Poor dietary practices, including inadequate intake of fiber and important micronutrients, are probably as significant as tobacco smoking in causing cancer. The consensus of scientists is that as much as 25 to 35 % of cancer mortality is related to dietary factors. This estimate is based on a large number of studies, although uncertainty surrounds the exact magnitude of the association and the biological mechanisms involved (Greenwald et al., 1986).

Obesity. Obesity is associated with a variety of health problems including diabetes (Rabkin, Mathewson & Hsu, 1977; Van Itallie, 1979), heart disease, gallstones

and gout (Hamburg, et al., 1982). Measures of obesity and changes (gain) in weight are also associated with undesirable low-density lipoprotein cholesterol (LDL-C) and inversely related to high-density lipoprotein (HDL-C) levels. These have been cited as important predictors of future coronary events in population groups. For example: "Data from the Metropolitan Life Insurance Company indicates that the mortality rate from diabetes for obese individuals was 400% of the expected. Mortality from cirrhosis of the liver, appendicitis and gallstones was 200% of the expected and from cardiovascular and renal diseases was 150% of the expected" (Bender & Bender, 1982).

In the United States, fifteen percent of men and twenty five percent of women are overweight (Abraham & Johnson, 1980). The Framingham study - a longitudinal study of risk factors for heart disease - concluded that apart from not smoking, weight reduction is probably the most important factor in the prevention of cardiovascular disease (Kannel & Gordon, 1970). In choosing target populations, obese individuals may be one group to benefit from such dietary change. As Hubert (1986) has recently noted:

Optimal preventive strategies will require modification of early markers for the development of CHD, hypertension, and hyperlipidemia. The accumulated evidence strongly suggests that overweight or obesity is such a precursor to disease development and that prevention of CHD can be greatly prompted by control of this attribute in overfed and sedentary populations such as those in North America.

Dental Decay. In affluent societies, nearly every individual has some tooth decay and a number do not have any natural teeth by the time they reach adulthood (Bender & Bender, 1982). The frequency of ingesting sucrose leads to tooth decay (Bender & Bender, 1982). The dietary prescription for tooth decay prevention is to limit the intake of sweets and to refrain from eating between meals.

Knowledge of these diseases and the particular dietary practices associated with them has led to specific dietary guidelines. The recommended diet for adults is high in fiber, complex carbohydrates, fruit and vegetable, and low in sugar, fat and salt (Gussow & Contento, 1984).

In conclusion, reducing CHD, cancer, and dental disease risk, and hence, incidence and prevalence through dietary approaches is an important goal from a large-scale, public health perspective. The next section briefly reviews recent interventions to change dietary practices.

Previous Interventions

While epidemiological research has made it clear what risk factors to focus on, it is not clear how to focus on specific risk factors. For example, weight control regimes from individual therapy, to group programs, to self-help, and worksite programs show minimal success (Brownell, 1986), except perhaps in highly self-selected samples of individuals (Schachter, 1982). One strategy for weight control entails moderate increases in activity and exercise

and an emphasis on a high-complex carbohydrate, high-fiber, and low-fat diet (e.g., Brody, 1985). Even if this regime does not work for everyone, it is the same dietary prescription for cancer prevention and cardiovascular disease prevention. Further, there are apparently no accounts of harm to individuals or populations who follow this kind of diet (Winett, et al., in preparation).

There are several different strategies used to promote large-scale dietary change. These include: (a) individual/small group training, which emphasizes nutrition education, food preparation demonstrations, lectures on risk factors, skills training, behavioral techniques, and therapeutic treatment; and (b) organization/large group training, which emphasizes school, worksite, community, government, and food place interventions.

Individual/small group level interventions require a great deal of work and time on the part of the program personnel. "This type of strategy may not be cost effective particularly if the purpose is primary prevention. Secondly, these programs seem to require a certain level of existing interest on the part of participants. They do not include strategies to create awareness or interest in the general population, but instead focus on high risk individuals or those who already have some type of disorder" (Miller, 1986).

Several different strategies are used to promote large scale dietary change. Organization/large group intervention may require less time and effort, be more cost effective, and require a lower level of existing interest than individual/small group intervention. Also, such an intervention may create awareness in the general population and provide information within the relevant setting. However, it is likely that such programs will yield smaller behavioral changes than more intensive efforts, but with those smaller changes magnified across a large number of people.

Worksite and School Programs. To date, most worksite dietary programs have focused on overweight and obese employees (Brownell, 1986; Wadden & Brownell, 1984), with much less attention directed toward dietary change in all employees (Fielding, 1984). At worksites, interventions for weight loss are becoming more effective (e.g., by using monetary incentives and competitions; Brownell, 1986; Jeffrey, Forster & Snell, 1985).

Stone (1985) identified fifteen ongoing school-based health research studies currently being funded by the National Heart, Lung and Blood Institute. These studies are researching the effectiveness of risk reduction strategies in school settings. The programs are addressing a variety of health behaviors including not only nutrition but also smoking, stress management and exercise. Most of the

studies involve elementary age students. The majority of studies are evaluating changes in knowledge, attitudes, behavior and physical measures.

One such study is the Chicago Heart Health Curriculum Program, funded by the Chicago Heart Association. James Schoeneberger is the principal investigator. The purpose was to increase health knowledge related to the risk factors for cardiovascular disease, to develop positive attitudes toward healthful living and self, and to encourage healthy behavior in sixth-grade public school students. From 1979 to 1982, 3,600 students in more than 200 classrooms were taught the "Body Power" program, which contains learning modules in nutrition, smoking prevention, exercise, and general health knowledge. The study's preliminary results show knowledge and attitude changes but little or no measurable behavior changes in the intervention groups.

Another such project is the Coronary Risk Factor Intervention in Childhood program. Conducted by the American Health Foundation (Walter, Hofman, Connelly, Barrett & Kost, 1985), this program has the objectives of reducing the incidence of cigarette smoking, and favorably shifting the distributions of blood pressure, blood lipid levels, body mass indices, and cardiovascular fitness. In the first year, 2,283 fourth graders were involved, and the intervention consisted of instruction in nutrition,

fitness, and cigarette smoking prevention for about two hours per week over the entire school year. Small but significant differences in a positive direction between the intervention group and the control group were found in blood pressure and plasma cholesterol levels.

Community Programs. Several large scale intervention programs have taken place in attempts to change dietary habits. One (Puska, Nissinen, Tuomilehto, Salonen, Kaskela, McAlister, Kottke, Maccoby & Farquhar, 1985) was conducted in North Karelia, Finland. Farquhar, Maccoby, Wood, Bietrose, Haskell, Meyer, Alexander, Brown, McAllister, Nash, and Stern (1977) of the Stanford Group also conducted a study in California. Both programs included extensive education programs and mass media campaigns. The focus was on multiple risk factors primarily pertaining to CVD. In Finland, the results indicated a decrease in serum cholesterol, a decrease in fat consumption, and an increase in the consumption of fruits and vegetables (Pietinen, Dougherty, Mutanen, Leino, Moisio, Iacono & Puska, 1984). In addition, there is some accumulating evidence for decreases in CVD-related morbidity, mortality, and resultant health care costs in target communities (Puska, et al., 1985). In California, the program resulted in a decrease in reported cholesterol intake and an overall risk reduction of 16% for the media only community, 20% for the media plus education community, as compared to the control

community (Farquhar, et al., 1977; Stern, Farquhar, Maccoby, & Russell, 1976).

These programs can be seen more as community locality and resource development, rather than the social action mold (Rappaport, 1977). Current efforts include more of a strategic emphasis on community organization and targeting of dietary change (Farquhar, Fortmann, Maccoby, Haskell, Williams, Flora, Taylor, Brown, Solomon, & Hulley, 1985). In addition, more attention to social marketing and media access appear to have made messages better targeted and more effective than in the prior products. Some additional refinement, streamlining, and attention to more passive procedures, as opposed to reliance on interpersonal processes, may also make community efforts more effective (Winett, et al., in preparation). However, even with the past successful efforts, it remains unclear what particular procedures are most effective.

Institutional/Societal Programs. There are several government programs that promote better nutrition by increasing the availability of nutritious foods. The Food Stamp program for low income populations enables families to buy a greater variety of foods. The stamps are accompanied by educational materials promoting appropriate dietary habits. The Special Supplemental Feeding Program for Women, Infants and Children (WIC) provides food vouchers for pregnant, postpartum and breast feeding women.

Individual and group counseling about nutrition is an integral part of this program. The Nutrition Education and Training program (NET) provides breakfast and lunch to millions of children in the school and day care settings.

Another method of increasing the availability of nutritious foods is to make certain food products more or less expensive or more or less desired by the public. Labels such as "light" demonstrate this approach. However, they may be misleading for the consumer. Unfortunately, rigid definitions are only beginning to regulate their use. Also, the media plays a part in promoting the desirability of products, which may occur whether or not the product is healthy (e.g., "lite" syrup or mayonnaise).

Supermarkets, Cafeterias, and Restaurants. Several large-scale studies investigated the effectiveness of promoting changes in dietary behavior in restaurants, supermarkets, and cafeterias. These may be optimal settings for intervention since there is a high rate (3.7 times per week) of eating in restaurants in America (National Restaurant Association, 1986), while most other food purchases occur in supermarkets.

Earlier cafeteria programs were more general and had marginal or no success. Now, more specific programs appear to affect customer choice. In three recent cafeteria studies (Dubbert, Johnson, Schlundt & Montague, 1984; Mayer, Heins, Brown, Bishop & Morrison, 1986; Zifferblatt,

Wilbur & Pinsky, 1980), attempts were made to modify cafeteria food selections with emphasis on the caloric content of food items. The interventions used labelling, prompting strategies (Dubbert, et al., 1984), an incentive-based nutritional awareness game (Zifferblatt et al., 1980); or a combination of these (Mayer et al., 1986). In general, each intervention resulted in the modification of selections within certain categories of foods, including vegetables, salads, and low-fat milk. One recent study (Mayer, et al., 1986) evaluated entree selection change, which is important since in most cases entree items contribute the most to total meal fat and caloric values.

Cafeterias are promising settings for behavioral interventions, given that: (a) they usually serve a wide variety of foods; (b) prices are relatively low (allowing for a more heterogeneous clientele); and (c) because customers serve themselves, strategies influencing food selections can occur in close proximity to actual selection (Mayer, Dubbert, & Elder, in preparation).

Two similar interventions have been tried in supermarket settings, both conducted with Giant Foods (National Heart, Lung, and Blood Institute, 1983), and based on pilot work on point of choice interventions (Zifferblatt, et al., 1980). The central theme of the first project was that given the facts, "you decide". The primary information vehicles were the Eater's Almanac, a series of

four-page brochures distributed every two weeks within supermarkets, and companion supermarket shelf tags called "Shelf Talkers." In the 26 issues, the "almanacs" provided facts about heart disease, cardiovascular risk factors, and nutrition. They identified dietary research questions that remained unanswered, but gave seasonal suggestions for food selection and preparation, such as holiday and summer meals. Thus, the almanacs may have been ineffective because their information was complex and vague (Winett, 1986). Presumably, the almanacs would be taken home and read. The shelf tags were placed directly below designated products to provide information at the point of selection.

Other promotional devices included radio spots, newspaper ads, in-store banners, window signs, and in-store posters, all tied into the almanacs. Over the course of the project, over two million almanacs were distributed. Importantly, however, most aspects of the program only focused on awareness and knowledge.

The evaluation assessed the feasibility of the approach, i.e., in-store nutritional education and private-public sector cooperation, awareness and use of the program by shoppers, reported nutritional knowledge and food habits, actual food purchases in the supermarket, and general interest in and dissemination of the program to other organizations. Evaluation instruments included telephone surveys and questionnaires with representative

samples of Giant Food store shoppers, and food purchase data generated by the computer-assisted checkout system in 10 Washington, D.C. and 10 Baltimore stores matched on demographic and sociological characteristics. There were also some unobtrusive observations made of shoppers.

Overall, the findings indicated great public and professional interest in the project; extensive and smooth cooperation between the representatives of the private and public sectors; some small significant changes in knowledge, but no actual change in purchase patterns.

Again, there was a move from complex to simple procedures. The second project used more specific shelf tags to indicate foods low or reduced in sodium, cholesterol, or calories (the persuasive, promotional materials used in the first project were not included in the second project). Based on evidence from the first project, it was decided to help an informed segment choose the right products with shelf tags. Levy, Mathews, Stephenson, Tenney, and Schucker (1984) reported that in about half of the targeted items, there were statistically significant shifts in the rate of product purchases in the experimental stores as compared to the control stores (about 4% to 8%). It seems that the second, more focused program had some impact, which is similar to the results seen with the cafeteria studies; thus, more specific, and

optimistically, simpler programs may be more effective for changing customer choice.

Another major site of intervention is restaurants. Presently, families spend over a third of their food dollars outside the home (Wadden & Brownell, 1984), and presumably many of these dollars are spent at fast-food establishments. Fast-food restaurants typically serve foods that are high in calories. It appears that no psychological studies in the literature have evaluated change in such an environment (although the cafeteria studies are similar). Thus, a study in a fast-food restaurant would be important, especially since these places seem to be gaining customers. The present study will evaluate change in a fast-food restaurant.

While intervention at the organization/large group level has many merits (previously mentioned), the potential problems should also be noted. Unfortunately, intervention at this level often fails to take into account the influence of individual variable such as weight, sex, current knowledge of nutrition, attitude toward nutrition and level of motivation of food choice behavior change. For example, studies have found that men tend to purchase higher calorie meals than women (Coll, Meyer & Stunkard, 1979; Stunkard & Kaplan, 1977). Some researchers (Dubbert, et al., 1984) have suggested, based on these results, that calorie content information may have a greater influence on

the food choice behavior of women than men. The implication is that the success of an intervention may, in part, depend on matching the specifics of the intervention with various characteristics of the population it is directed toward; a basic tenet of social marketing (e.g., Manoff, 1985). The present study utilized formative research in an attempt to evaluate the best "match".

Conceptual Foundations

A behavioral systems framework (Winett, 1986) is the foundation of this proposal. As described by Winett, "this framework is an amalgamation of social learning, communication and behavior analysis principles overlaid by social marketing concepts and variables" (p. 2). The emphasis in this framework is on the bidirectional reciprocal relationship between behavior, person variables and environment. It allows for analysis of concepts, principles, procedures, and methods. The framework emphasizes the importance of formative and pilot research.

Behavior analysis involves the definition of target behaviors and their antecedents and consequences. It is based on the operant conditioning paradigm. The focus is on manipulating the environment in order to maximize the occurrence of desirable behaviors and minimize the occurrence of undesirable behaviors. One of the primary difficulties in changing eating behavior is that foods low in nutritional value offer immediate reinforcement. The

effects of eating either appropriately or inappropriately are generally not readily discernible so that the contingencies may not be clear. Also, foods that are more nutritious may be more expensive. In this study's intervention, the focus was on using a brief, simple message ("prompts") to alter consumer food choice.

Cognitive analysis involves the evaluation of thoughts, such as in information processing for making decisions and beliefs and perceptions. It involves both low-involvement and high-involvement decision-making. For example, it is important to determine when the consumer makes a decision about a food choice and whether or not it is an important or difficult decision. If the decision about the food choice is made before the consumer enters the establishment, point-of-purchase information may not be useful (to change might involve high-involvement). If a consumer likes several items, choice might involve low-involvement. The characteristics of fast-food restaurants are an important part of this process. For example, will the consumer evaluate the difference in cost between two choices before making a decision? Likewise, customers' perceptions and beliefs about products influence choice. For example, if customers believe that low-fat meals are important, and this belief can be made salient in menu items, low-fat menu selections may be increased.

Social learning theory, now reformulated as social cognitive theory (Bandura, 1986) entails the interactions of cognitions, behavior, and environment. In the present work, specific customer beliefs formed a basis for modifying the restaurant environment in a particular way so that a specific set of behaviors, menu item selection, was altered.

Behavioral systems theory emphasizes three systems notions: context, interdependency, and multilevel analysis. Context refers to the barriers and facilitators of behavior change including physical, economic, psychological, cultural and situational factors. Physical factors associated with this proposal particularly include aspects of the fast food milieu and the availability of alternative food selections. Economic factors include the cost of patronizing fast food establishments, and the relative economic, social, and psychological costs of alternative food selections. The psychological factors associated with eating are extensive. They include eating motivated by a variety of emotional factors and the association between certain foods and comfort or a number of other positive and negative feelings. Cultural factors may include preference for certain ethnic foods, dietary restrictions due to religious beliefs, or in this case, preferred selections by different types of individuals frequenting fast food establishments. Situational factors include transportation

to the establishment, the decision of a group (e.g. lunch break with colleagues), or the stress associated with social activities centered around eating (e.g. eating in the presence of others or eating in a hurry to return to work).

Interdependence is defined as the recognition that behaviors are interrelated and that effects at different levels interact. Thus, a multilevel analysis requires awareness of the possible influences of the proposed project on a variety of levels - individual, group, and community. This project targeted individual behavior change, but could also influence the general consumer behavior, in grocery stores, for example.

Social Marketing Approach. In the past 10 years, marketing has expanded to include marketing of social causes. Social marketing is defined as the design, implementation and control of programs calculated to influence the acceptability of social ideas and involving considerations of product, planning, pricing, communication and marketing research (Fox & Kotler, 1980). Identifying the target market and its segments is an important step. In this case, the target market has been established as those consumers who eat in one fast food restaurant. Segmentation of the consumer market was evaluated during the formative research phase of the project. It was found that approximately 50 % of one customer sample knew what they

would order before they arrived. Thus, different approaches may be needed to influence different segments of consumer populations.

Product development involves the assessment of the current food choices of the target population, and the amount of potential change. The tangible product is a salad, and what is involved in that choice (e.g. choosing to eat a salad to "fit an image" or "be healthy"). Thus, the overall "product" is a menu item symbolizing health and fitness.

In this research, assessments were conducted through surveys, interviews, and observation. Customer habits and beliefs were assessed to determine how selections were made. Survey information indicated that consumers would be more interested in a "low-fat" label than one concerning sugar, salt, or calories. Two potential populations were considered: those selecting a salad for their entree and those selecting a salad in addition to their entree. The message was designed to influence both of these populations. The place chosen was a fast food restaurant, which provides valuable information about a popular kind of eating location.

Price includes money costs, energy costs, opportunity costs and psychological costs. The costs to the consumers in this case include the loss of the opportunity to eat something else, the possibility that the "healthy"

selection will cost more than an alternative selection, the energy to read the message, the psychological cost of becoming aware of the nutritional value of their diet and possible guilt associated with choosing to eat foods without nutritional value. The cost to the staff includes the energy required to work on the program in an advisory capacity and to provide weekly sales totals, the loss of the opportunity to use this time for another activity and the psychological cost associated with allowing outside personnel to conduct a program without knowledge or assurance of the outcome. Effective interventions seek to reduce a range of costs for individuals and organizations.

An additional consideration in the marketing analysis is positioning. The fast-food restaurant chosen for this project has established (a) a reputation as a place that serves "healthy" food, and (b) that it will compete with other establishments for this market segment. However, this restaurant offers a salad bar, but also shakes, a variety of hamburgers, potatoes, chili, and chicken filets. It does not serve breakfast, is not open 24 hours, and it does not offer cold sandwiches. Thus, the intervention in this study was also designed to enhance the setting's market position.

Background Research

Formative Research. Formative research is research conducted to guide the development of a project or program (Palmer, 1981). One model for formative research is the

social marketing model discussed above, which was used to develop the present intervention. The techniques used were surveys, interviews, and observations.

The following information was provided by a survey: (a) approximately 50% of the individuals reported that they know what they will order before they arrive, (b) approximately 25% reported that they order the same thing every time they frequent the establishment. Consumers are more interested in "low-fat" as a label than one with sugar, salt, or calories. Consumers indicated that they are interested in eating food that is "healthy".

Observation yielded information about the difference between lunch and dinner crowds, and the difference between weekday and weekend crowds. The lunch crowd on one week day consisted of approximately equal numbers of male and female customers, representing several different age categories. The groups appeared to mostly consist of students and work colleagues. The dinner crowd on one week day consisted primarily of students and families. The clientele were mostly of the Caucasian race.

In-store observations of customer flow and traffic patterns yielded information about where customers look when they enter and order. When there was a crowd at the entrance, customers tended to scan the immediate area; when there was not a crowd, customers tended to go directly to the cash register where orders are placed. At this point

customers would look at (a) the menu board, or (b) the employee at the register. If there were only a few people in line, customers tended to look at the menu board or at the register. This information was then utilized during the pilot research phase.

Pilot Research. During the first pilot research phase, one sign was placed above the cash register. For one-hour observations, customers were surveyed to determine: (a) if the salad sign had been noticed, and (b) what each thought was written on the sign. With the prompt in this location, about 20% reported that they had noticed the sign. It was determined, that in this location the sign was too far above eye level. Next, the sign was placed above the menu board, and the identical procedure was used for assessment. In this location, about 50% reported that they had noticed the sign. After further observation of customers' visual gaze upon entering and ordering, it was decided to place two prompts with identical messages near the register; one above the menu board and one in front of the cash register. Thus, the in-store observations and small-scale pilot studies yielded the specific data needed to proceed with the larger project.

In an interview with the owner, it was discovered that the Blacksburg establishment has a high base rate for salad sales. This was substantiated by a sample weekly sales report (from November 1, 1986) which has listed sales from

thirty identical restaurants. The Blacksburg establishment had a salad percentage of 9.7 (mean = 6.15 for all restaurants) for the week.

Measurement. Researchers in the area of health promotion/disease prevention indicate that an accurate and objective measurement system is essential to the success of program evaluation (Joni Mayer; personal communication, November 20, 1986). This is often difficult to achieve in field research. For example, in the present setting, there were many variables to consider besides the percent of salad sales, such as daily and seasonal variations (e.g., people tend to eat more salads when it is warm), how the change is being made (e.g., is the nutritional item added or substituted), and price differences (e.g., side salads are more expensive than french fries). These additional problems were addressed by use of a comparison site.

For this study, the computerized cash register system was utilized to provide one measure of behavior change. The system records every item purchased, provides a daily and weekly dollar sales total of each item, and the daily and weekly dollar amount of total sales. The advantages of using computerized cash register systems include: unobtrusiveness, efficiency, and accuracy; the disadvantages include: technical problems and the inability to record demographic data (Mayer, Dubbert, & Elder, in preparation).

One method of measurement involves using a percentage number to determine sales change (e.g. the total dollar amount of salads sold in one week divided by the total dollar amount of all menu items sold in the same week). A percentage is helpful in accounting for different customer flows each week. However, this percentage is based upon a dollar amount; therefore, this number may not accurately reflect a sales increase of one item alone. For example, if salad sales increase, but the net total also increases due to increased hamburger sales, the change may not be seen in the percentage number. A second method of measurement involves using the quantity of an item sold. For example, the total number of salads sold could be divided by the total number of entrees sold. This could be determined by using the computerized system and it can be augmented by providing the dollar amount, which could then be divided by the price, to provide a number which equals the quantity sold. This, however, was not possible in the present study as the restaurant administrators of this national chain restaurant do not allow public knowledge of their sales figures (see Appendix A for correspondence concerning confidentiality).

The final measure that was used in this study was the percentage of dollar sales. However, the total number of salads sold includes salad bar and side salads. An in-store nutrition message was used in this study. Therefore,

consumers using the carry-out window were not influenced by this message, but were part of the data base. Also, side salads may be ordered for carry out, but not salad bars. Salad bar and side salad percentages were reported and examined separately, but also combined for analyzes. Thus, it is recognized that neither a count of salad bars alone, side salads alone, or salads together provides an entirely accurate reflection of behavior change attributable to this promotional nutrition message. Thus, estimates of change should be conservative in this study.

Finally, in-store observations of salad purchases were also used to provide an objective behavioral measure. The total number of salads purchased (side salads and salad bar salads) was divided by the total number of customers.

Rationale

The need for programs promoting nutritious eating on a large scale has been described in prior sections. The rationale for the specific type of intervention chosen has also been discussed (i.e., a simpler, more specific approach may be more effective). This intervention is based on formative research, conducted by following a social marketing framework. In addition, an emphasis was placed on determining an accurate measurement system.

It also has been generally shown that programs which provide more specific information have been more effective (Winett, 1986). Thus, providing specific information within

restaurant settings may be the most effective way to reach those customers who may benefit most from such an intervention.

This intervention could potentially influence a large number of people with relatively little expense, an approach which is compatible with a public health orientation. As of yet, however, few studies have shown change in more than one place, provided qualitative and quantitative information about the entire menu, fully described the demographics of the population, and provided follow-up data which was not related to the study design, i.e., withdrawal (Mayer, et. al., in preparation).

Objectives

The purpose of the present study was to change one food selection choice in a restaurant. Customers in a national fast-food restaurant were influenced to choose one low-fat, high-fiber selection (i.e., salads). A simple visual and verbal message was used to influence change. All items are offered every day for lunch and dinner: thus, no menu cycle across study phases is involved to act as a confound. The computerized cash register system of the restaurant was utilized to provide an objective measure. In addition, and as described below, data from an identical restaurant were used as a comparison base, i.e., to control for seasonal variations and other promotions of the national chain. This study also addressed demographics of

gender, age, and race. In addition, frequency of customer patronage and patrons' pre-selection knowledge was assessed.

It was hypothesized that (a) implementation of health promotion prompts would increase consumer awareness of nutritional options, and (b) implementation of the health promotion prompts would increase consumer consumption of side salad and salad bar selections.

Method

Setting and Subjects

This study was conducted from Sunday, January 11 through Saturday, March 14, 1987, in a national chain fast-food restaurant located in Blacksburg, Virginia. A follow-up phase lasted from April 5 through April 26. The restaurant is located in a university town (approximately 23,000 students and 35,000 residents). It is open daily and has a seating capacity of 102. Approximately 30-35% of the lunch and dinner clientele are university-related customers (this figure was derived from weekly sales percentages, using a comparison of school in-session versus out-of-session).

Another restaurant in the chain (with identical entrances, cash register location, menu location, and salad bar location) in the neighboring town of Radford, Virginia was used to provide no-treatment comparison data. Radford

is also a university town (approximately 7652 students and 6048 residents). The restaurant is open daily and has a seating capacity of 72. Approximately 20% of the lunch and dinner clientele are university-related customers.

Intervention

A procedural extension of a prompting strategy was used in an attempt to influence customers to choose a healthy entree or add a healthy item to their meal. The intervention was directed toward influencing customers through a simple visual and print message presented with multiple prompts. The salad bar was identified as the low-fat, high-fiber food selection. The message, "Be Fit & Healthy; Eat a low-fat SALAD as your meal or add a side salad," was based on themes derived from formative and pilot research at the restaurant (see Background Research). Colorful pictures of salads were included in the prompts. These prompts were located near the cash register, where customers place their orders. The points were established through formative and pilot research as described above.

Materials

The intervention consisted of (a) placing two large (18 in. by 18 1/2 in.), colorful posters with the health promotion message and picture of a salad near the cash register, where customers place their orders (one was in front of the cash register and the other was above the menu board), (b) placing small (4 by 4 1/2 in.) table tent cards

with the same message as the posters on each table in the dining areas, (c) placing a large (10 by 28 in.) banner with the message, "Eat Salads" (black letters on a white background) at the entrance to the restaurant, and (d) placing decorative 8-foot-long streamers between the entrance and the cash register displaying bows (6 by 3 in.) with "Eat Salads" and "Salads" printed on them (see Appendix B for photograph of posters). The table tent cards were checked each evening before closing by the restaurant staff and replaced when missing, to ensure 100% placement.

An 11-item yes/no questionnaire was administered on 54 randomly selected days during the nine weeks of the project. The questionnaire was administered to customers before they exited to assess (a) whether or not customers noticed the prompts, (b) their past attitude toward nutrition, (c) the influence of the message on their choice that day, and (d) their self prediction of future behavior (e.g., "I will choose to eat a salad the next time"). During intervention, questions referred to the prompts, which were not present during baseline 1 and 2; therefore two questions were rephrased to inquire about an in-store advertisement during baseline and reversal (see Appendix C for questionnaires).

Experimental Design

An A-B-A-B reversal design was used, with the addition of the no-treatment comparison site in Radford. A follow-up phase was also included in the study's design.

Beginning with baseline, and throughout the study, daily and weekly entree sales percentages were obtained from the computerized cash register system in both locations. Entree sales percentages were obtained from the intervention site at 3:00 P.M. to make a comparison between lunch and dinner sales. Questionnaires were administered to customers at the intervention site in Blacksburg. Intervention consisted of placing the prompts at the entrance and near the cash register, and placing the tent cards on the tables. During baseline 2, all intervention materials were removed from the restaurants. During intervention 2 all materials were replaced.

The following independent and dependent variables were used in this design. Independent Variable: presence of a nutrition promotion message displayed with multiple prompts; and Dependent Variables: (a) questionnaire responses, (b) daily sales percentages of entree items, (c) daily sales percentages of salads-combined (salad bar and side salad sales together), (d) weekly sales percentages of entree items, (e) weekly sales percentages of salads-combined, (f) 3:00 p.m. sales percentages of entree items, and (g) salad percentage "counts" (one-hour in-store

observations of the total number of customers choosing a salad bar or side salad divided by the total number of customers). A sample recording sheet is provided in Appendix D.

Procedure

This study was conducted for nine weeks during the Winter quarter (January 11 through March 14, 1987), which included baseline (4 weeks), intervention (3 weeks), reversal (1 week), and intervention-2 (1 week). A follow-up phase lasted from April 5 to April 26. The prompts were placed in the Blacksburg restaurant during intervention times (February 8-28 and March 8-14). The Radford restaurant served as the no-treatment comparison, i.e., for seasonal fluctuations and other corporate promotions (Zifferblatt, et al., 1980). The menu was identical in both locations, and it was identical for both lunch and dinner.

The staff members in both locations were asked not to change the regularly-offered menu items during the study, and to instruct the investigator if anything was altered. Prices and in-store advertisements were identical in both locations. Although coupons and out-of-store advertisements were approximately identical in both locations, they were not stable throughout the study. Holiday coupons were given out to customers in December and were redeemable during the month of January (i.e., \$1.99 for a meal combo or potato and coke; \$0.99 for a hamburger or kids' meal). Customers

received coupons for January and February through direct mail (i.e., eight coupons, including four for a \$0.25 hamburger, two for a \$1.89 meal combo, and two for a \$0.99 kids' meal). During one week (February 15-21) twenty different coupons could be redeemed by customers at either the Blacksburg or Radford restaurants.

Questionnaires were administered to 1,239 customers on 54 randomly selected days by undergraduate psychology students. These days were counterbalanced for lunch and dinner, and for weekday and weekend. The number of days for questionnaire administration in each category (lunch versus dinner and weekday versus weekend) during each phase are presented in Table 1. Several days were missed due to snow and scheduling difficulties. Questionnaires were not administered during the follow-up phase.

Daily and weekly sales percentages of entree items were obtained from the existing computerized system (item dollar sale divided by total dollar sale) for 9 weeks from the intervention site and 6 weeks from the comparison site. A complete data set was not available from the comparison site because of computer malfunctions. Weekly sales percentages of entree items were obtained during the follow-up phase. Percentage numbers are beneficial for eliminating some of the differences which are due to daily variations in numbers of customers. Afternoon sales percentages were obtained on 9 randomly selected days at 3:00 p.m. from the

Table 1
Number of Days for Questionnaire
Administration During Each Phase

Phase	Weekday		Weekend	
	Lunch	Dinner	Lunch	Dinner
Baseline	5	8	4	5
Intervention	5	5	6	4
Reversal	2	2	2	0
Intervention	3	2	0	1

intervention site to allow for a comparison of lunch and dinner.

Salad "counts" (the total number of customers who purchased something, and the number of customers who purchased salad bar and side salad selections) were made two days per week for five weeks. These began during the first intervention phase. These one-hour in-store observations were made by undergraduate psychology students during lunchtime (12:00-1:00 p.m.). On several days, two of the observers monitored salad bar and side salad selection purchases and number of customers simultaneously to obtain an index of inter-rater agreement.

Customer demographics were obtained for gender, age category (0-17 years, 18-39 years, 40-65 years, and 66+ years), and race (Caucasion, Black, Hispanic, and Asian) using frequency counts of 1,982 Blacksburg customers. Two surveys were taken in Blacksburg. One survey was administered to 152 customers on six randomly selected days to obtain information about whether or not patrons knew what they would order before they arrived. A second survey was administered to 407 customers on 26 randomly selected days to determine the frequency of repeat customers.

Results

Sales Data

The major data for this study and indicants of behavior change were the sales data on percentage of salad sales (i.e., salad bar selection, side salad selection, and salads-combined) at the intervention and comparison sites. Salads-combined includes salad bar and side salad selections. An acceptable correction procedure that has been used in other consumer behavior research (e.g. Winett, Leckliter, Chinn, & Stahl, 1984) was used to graphically represent sales data of several entrees (i.e., salad bar, side salad, salads-combined, special hamburger, single hamburger, and taco salad selections).

The graphical representation of salads-combined, is shown in Figure one. For each day's data "a corrected percent total of sales" was derived by the proportion of: [(A given day's percent of salad sales in Blacksburg divided by the overall baseline percent of salad sales in Blacksburg) divided by (A given day's percent of salad sales in Radford divided by the overall baseline percent of salad sales in Radford)] X 100%. For example: Day's percent salad sales in Blacksburg = 8.0%; Baseline mean percent salad sales in Blacksburg = 7.2%; Days percent salad sales in Radford = 6.2%; and Baseline mean percent salad sales in Radford = 6.0%. Thus, $[(8.0 \div 7.2) \div (6.2 \div 6.0) \times 100\%]$ =108%. Therefore, on the exemplar day, at Blacksburg,

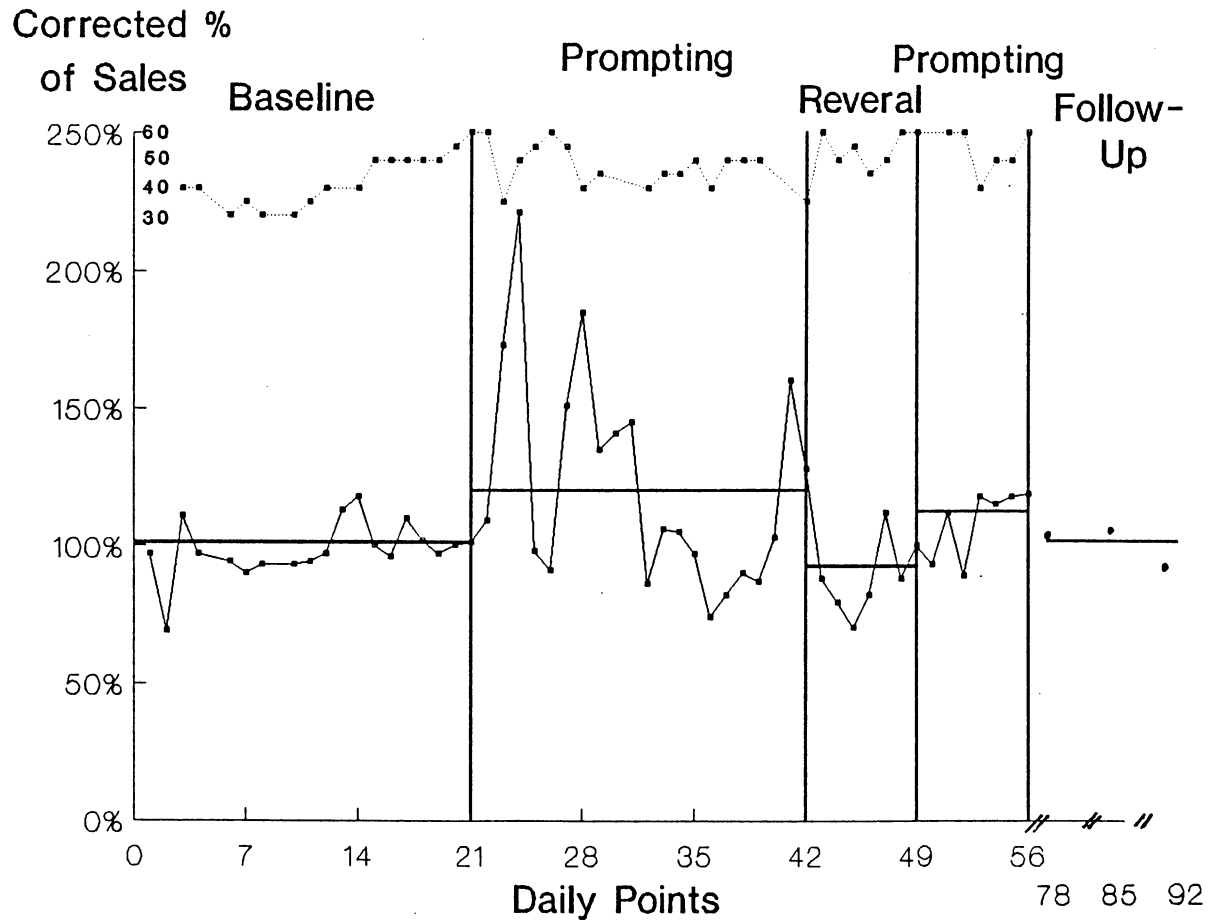


Figure 1. Daily Corrected Percent of Sales for Salads-Combined in Blacksburg for all Phases (weekly only for Follow-Up) with Daily Temperature (30-60 Degrees Fahrenheit)

corrected percent total salad sales was 108%, or an 8% increase over the baseline (100%) mean. In this system, 100% represents no change, while a percent less than 100%, means fewer salads than expected were sold.

An examination of Figure one shows that at baseline, except for one early data point, most data points were within 10%-15% of baseline. Across baseline, the corrected sales data averaged a mean of about 100%. With the introduction of the prompts, initially large increases in salad sales were followed by drops in sales, followed by five high sales days, then about a week of lower sales days, ending with two high points. Across the intervention phase, corrected sales data averaged a mean of about 115%. A one week return to baseline showed some variability, but corrected salad sales averaged a mean of about 90%. For the second intervention of one week, there was some variability, but also a clear upward trend. Across this phase, corrected sales averaged a mean of about 109%. The corrected percent of sales for weeks two and three in Radford was computed using the mean from week four, since the data were missing (this applies to all six figures). The accuracy of this estimate is supported by the low variability in Blacksburg across the corresponding weeks. Figure one also includes daily temperatures, which range from approximately 30 - 60 degrees Fahrenheit.

Follow-up data were only obtained on a weekly basis. Once again, there was variability in the weekly sales data, but the corrected sales data averaged a mean of about 99% across the three weeks of the follow-up phase.

Thus, it appears that considerable variability was shown in corrected salad sales data within phases. However, across phases, increases in the corrected percent of salad sales were shown with the introduction of the prompts, and a decrease (return to baseline or below) was shown when prompts were removed.

A visual inspection of the "corrected percent total" for the individual side salad and salad bar selections indicates similar results (see Figures 2 and 3). In addition, a visual inspection of the "corrected percent total" for the taco salad, special hamburger, and single hamburger selections, selections which were not represented by associated prompts, indicates that sales did not increase and decrease systematically with the intervention (see Figures 4, 5, and 6). Furthermore, taco salad sales increased slightly during the first intervention and remained at approximately this level throughout the remaining phases. Also, sales for the single hamburger and the special hamburger decreased during the second intervention of salad prompting. Thus, as hypothesized, point-of-purchase prompting increased salad sales in Blacksburg as compared to Radford. In addition, the salad

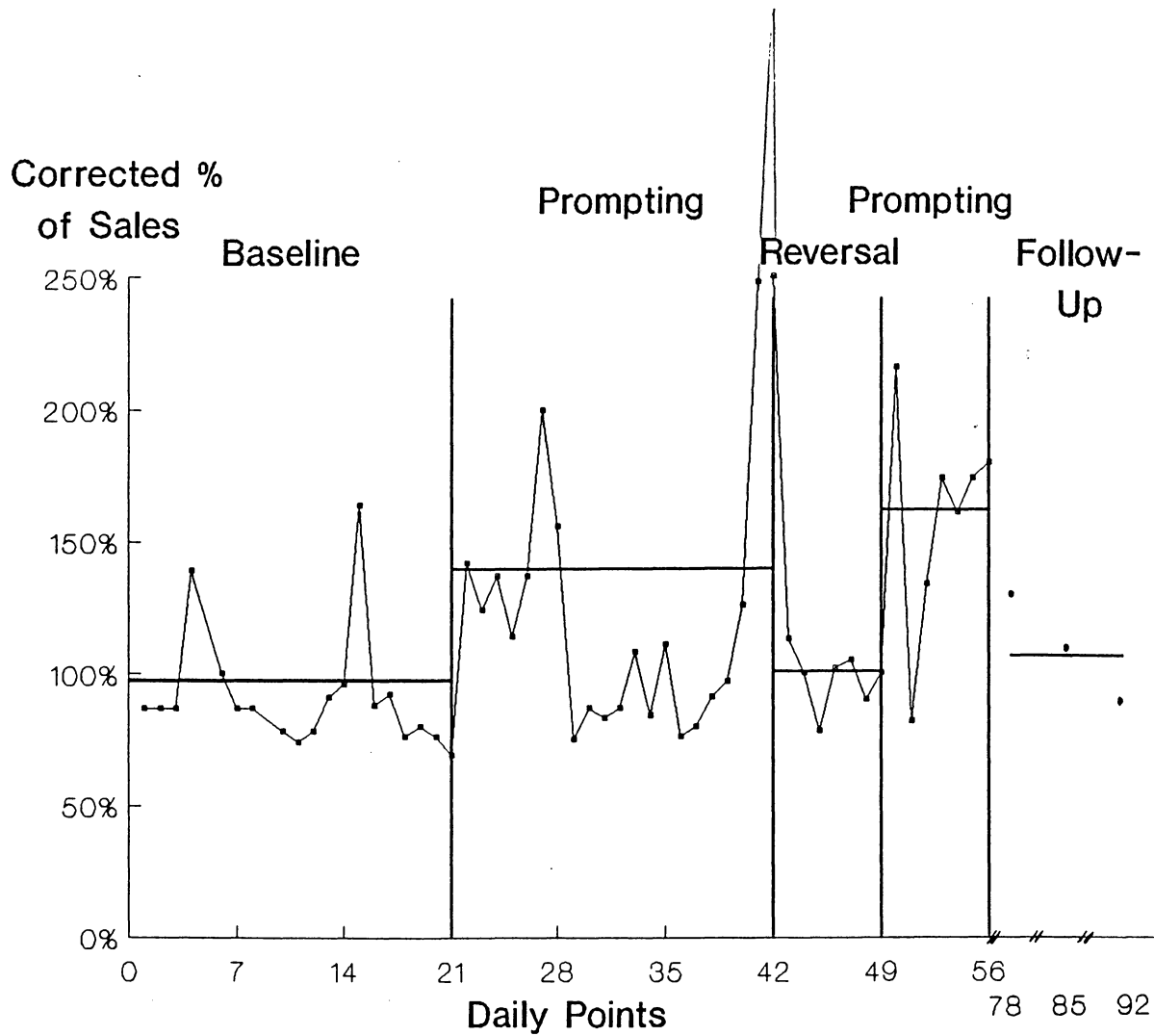


Figure 2. Daily Corrected Percent of Sales for Side Salads in Blacksburg for all Phases phases (weekly only for Follow-Up)

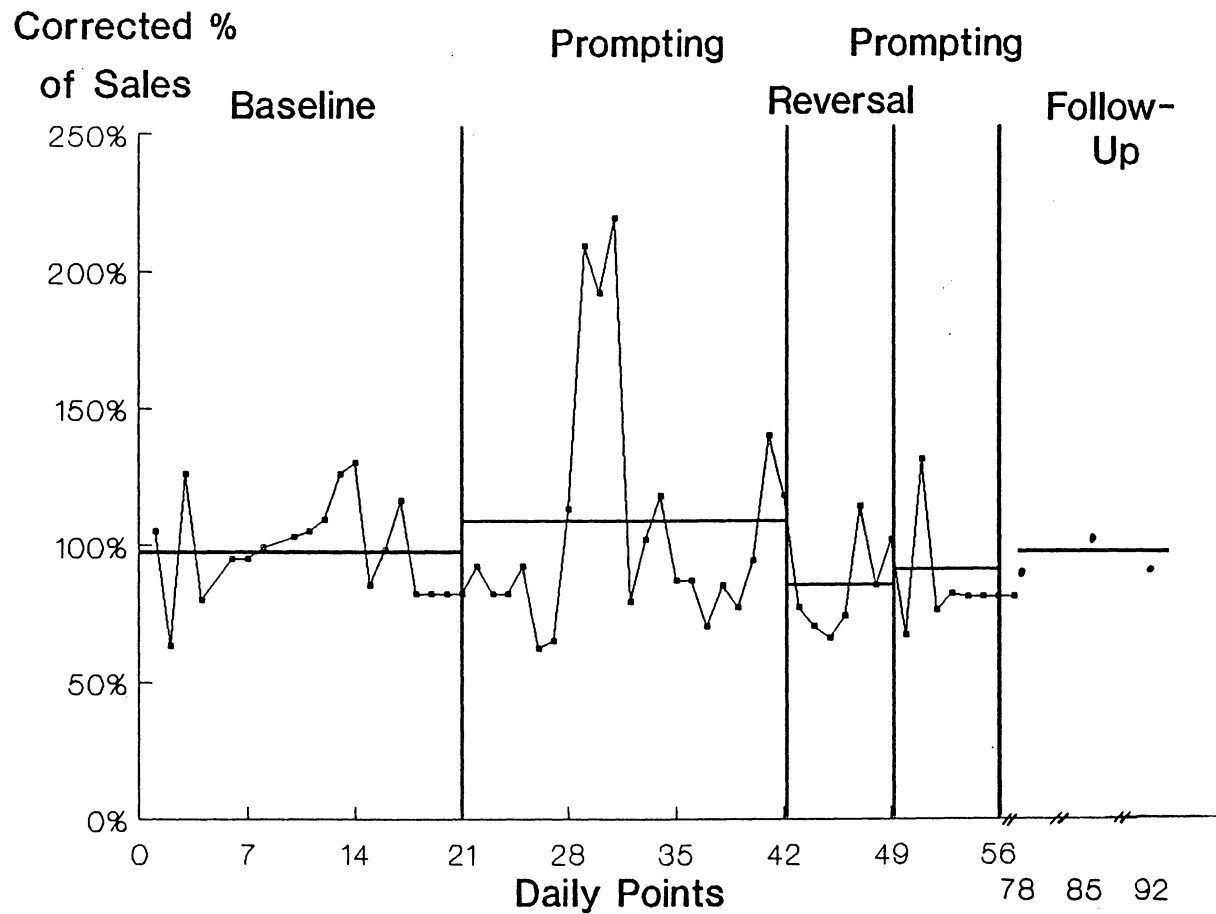
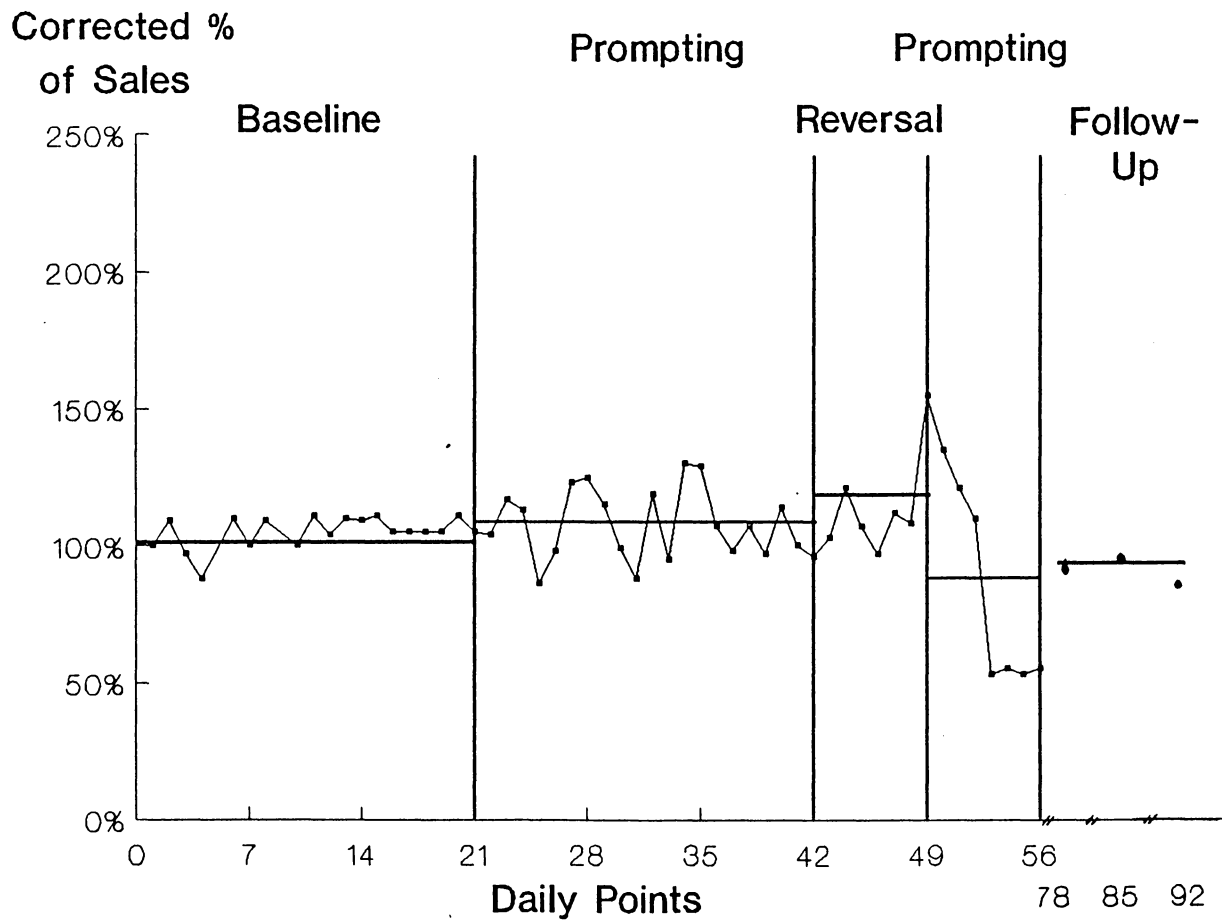


Figure 3. Daily Corrected Percent of Sales for Salad Bar in Blacksburg for all Phases (weekly only for Follow-Up)



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Figure 4. Daily Corrected Percent of Sales for Single Hamburger in Blacksburg for all Phases (weekly only for Follow-Up)

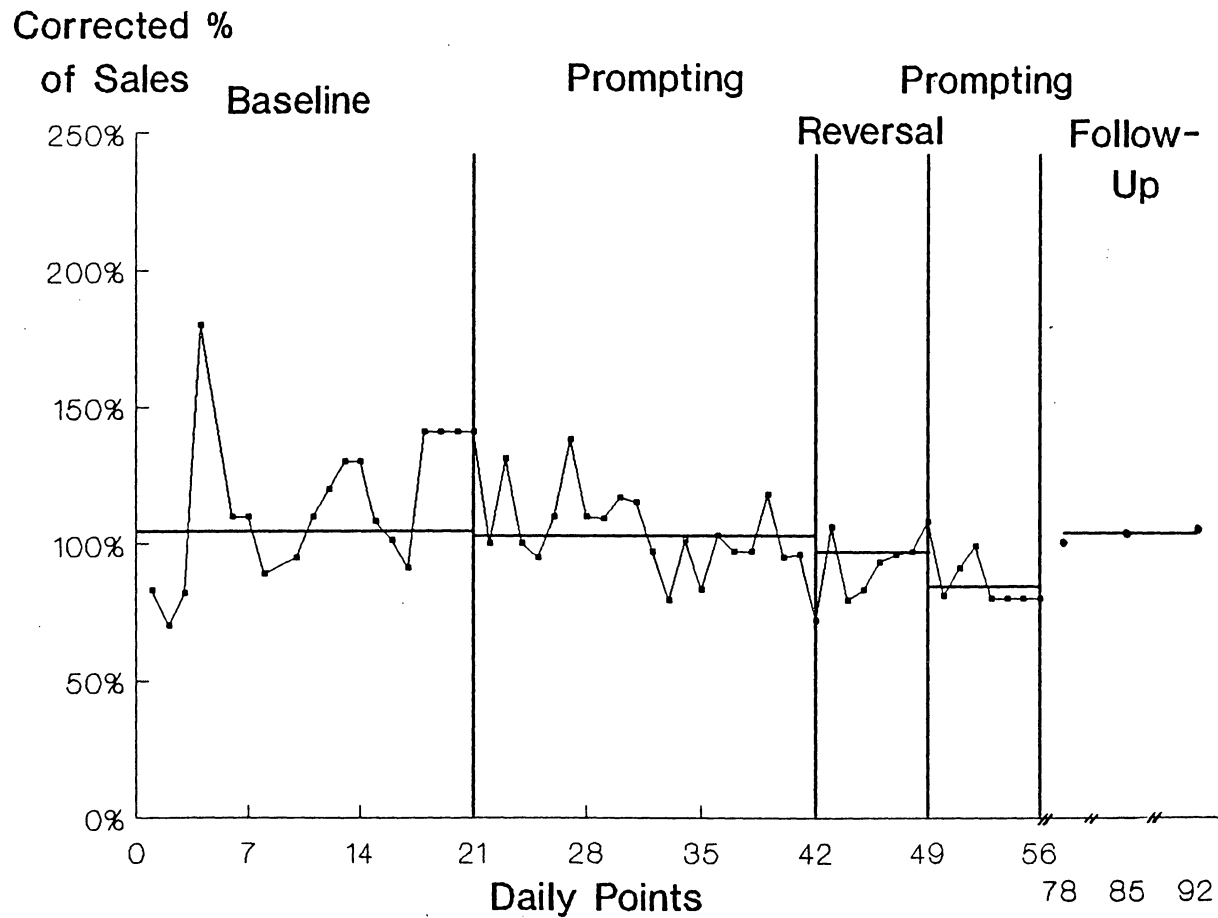


Figure 5. Daily Corrected Percent of Sales for Special Hamburger in Blacksburg for all Phases (weekly only for Follow-Up)

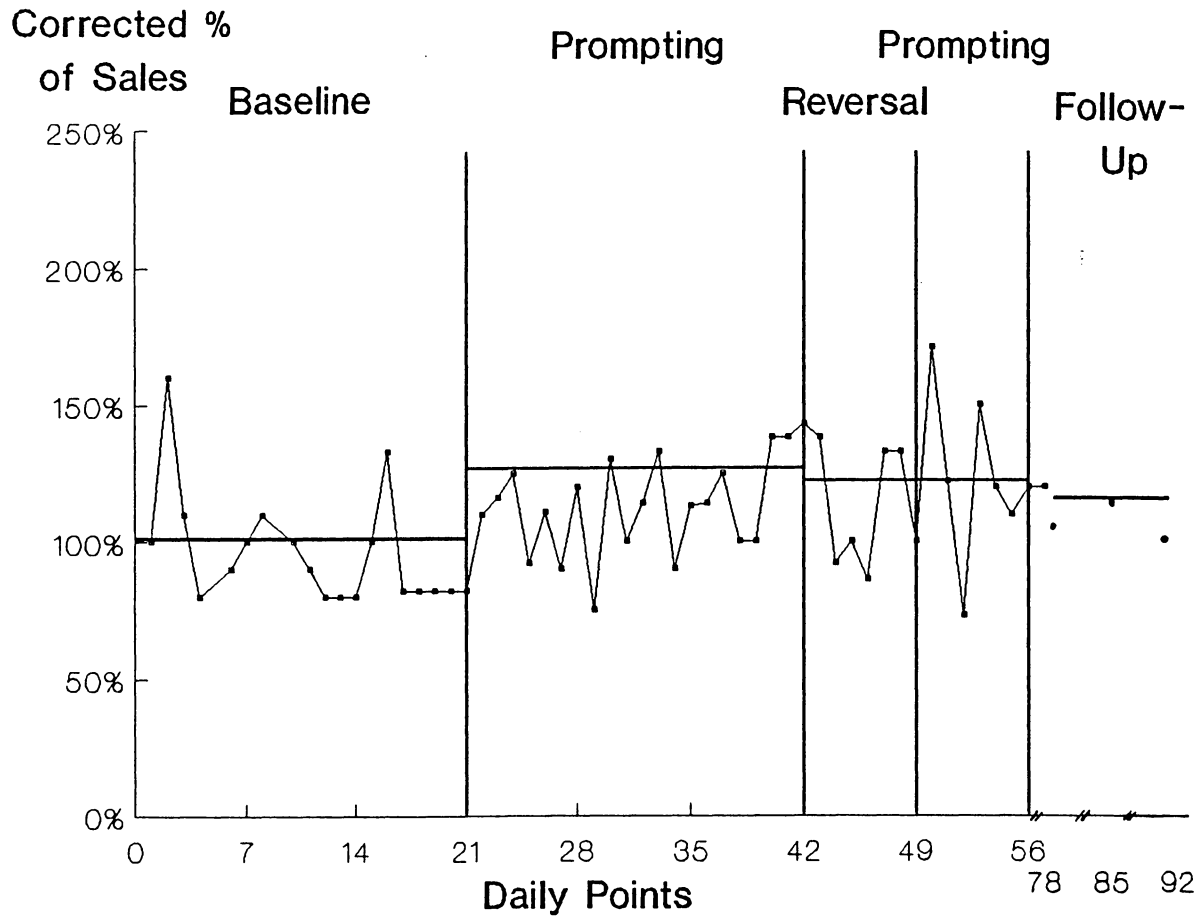


Figure 6. Daily Corrected Percent of Sales for Taco Salad in Blacksburg for all Phases (weekly only for Follow-Up)

prompting may also have affected other selections in positive directions.

A correction procedure is useful for field research, especially since a completely "matched" control may not be possible. In this project, the actual sales data are different in the two locations (e.g., for week 6: Blacksburg Salad Bar sales were 4.7% and Side salad sales were 2.4%; Radford Salad Bar sales were 3.1% and Side salad sales were 2.1%), but sales increases and decreases are believed to covary. Analyses using a correction procedure provide an accurate estimate of change when the data obtained are not identical; however, these data are dependent because each day is divided by the baseline mean, which makes further statistical analyses difficult. The assumption of independence is necessary for parametric and non-parametric statistics. Also, a non-parametric test is not useful when there are several tie scores. Thus, visual inspection offers the best means of evaluation for these data. Visual inspection provides a way to evaluate whether change is reliable, especially if accompanied by a report from a contact person to help evaluate whether an important change was obtained (Kazdin, 1984, p.89). In this case, the manager of the Blacksburg restaurant verified the significance of the increases during prompting and decreases upon withdrawal.

Temperature is an important factor, since there is evidence to suggest that weather is a covariate (with salad sales increasing during warmer weather and decreasing during cooler weather). Temperature during this project was variable, as demonstrated by visual inspection of Figure one and the weekly mean "high" temperatures, which are reported in Table 2. For this project, Radford was used as a comparison base to control for the effects of weather; however, the success of salad prompting may still depend on temperature. This is evidenced by the variability of daily points on Figures 1, 2, and 3 (e.g., note that during the first intervention, the temperature during week two was lower than during week one or three of the same phase).

Survey Data

Each question of the 11 item yes/no questionnaire was analyzed using an ANOVA with an arc sine transformation (e.g., Kempthorne, 1979, p. 156) (see Appendix E for transformation formula). For question one and two ("I eat nutritious foods most of the time" and "I think low-fat foods are healthy," respectively), the results indicate a significant interaction effect ($p < .05$) for treatment x day (weekday or weekend). Thus, consumers' self-report may be influenced by the introduction or removal of a health promotion message depending on whether it is a week day or weekend. For question three, four, and five ("I noticed the salad poster -or advertisement poster," I looked at it for

Table 2
Mean Weekly "High" Temperature for all Phases

<u>Week</u>	<u>Temperature (F)</u>
1	38
2	35
3	52
4	51
5	42
6	44
7	57
8	51

several seconds," and "I think it is appealing," respectively), the results indicate a significant main effect ($p < .05$) for treatment. The mean proportion of yes responses for questions 3, 4, and 5 were 61, 37, and 39%, respectively for Baseline-1; 87, 62, and 56%, respectively, for Intervention-1 (treatment). Sample questionnaires for treatment and baseline conditions are included in Appendix C.

Lunch versus Total Sales Data

Percent of sales for each entree was recorded by the manager using each day's computer reading at closing. In addition to the closing percentages usually obtained, entree percentages for "lunch" (taken at 3:00 p.m.) were obtained on nine randomly selected days. These percentages (for lunch and total day) for several entree items are presented in Table 3. The total day percentage includes the lunch percentage. Visual inspection indicates no great differences between the lunch and evening readings.

Observations

In-store observation "counts" of the (a) number of customers and (b) number of side salad and salad bar selections purchased began during the first intervention phase. These were begun only after the intervention started, because the restaurant's management unexpectedly reconsidered their decision concerning data release. They declined report of actual sales figures for this project

Table 3
Lunch and Total Day Percentages
 (on 9 randomly selected days)

Entree	Lunch (%)	Total day (%)
Side Salad	2.2	2.0
	2.3	2.0
	1.2	1.7
	2.4	2.2
	1.9	2.2
	2.2	2.1
	2.9	2.6
	2.4	2.4
	2.3	2.4
Salad Bar	6.0	6.0
	5.6	5.1
	6.5	6.3
	5.4	5.2
	5.0	4.8
	4.5	4.6
	4.6	4.7
	5.6	5.9
	5.3	5.6
Single Hamburger	13.8	13.9
	14.9	14.9
	16.0	16.1
	15.1	15.4
	15.0	15.1
	13.2	15.1
	12.6	12.8
	12.1	12.3
	12.7	12.6
Special Hamburger	8.7	9.8
	13.0	13.4
	15.1	15.5
	14.5	14.1
	14.2	14.3
	20.7	20.5
	20.9	20.9
	17.9	17.6
	17.9	17.7
Taco Salad	3.5	3.3
	2.6	2.6
	2.8	2.2
	2.8	2.6
	2.9	2.9
	2.5	2.5
	2.5	2.5
	3.3	3.2
	3.2	3.2

due to confidentiality (see Appendix A for correspondence). For the observations, inter-rater agreement was computed using the following formula:

$$\frac{\text{n of agreements}}{\text{n of agreements} + \text{n of disagreements}} \times 100$$

Of the 220 observations that were made simultaneously, 217 (99%) were in agreement.

Interpretation of these data is limited due to the lack of in-store baseline observations; however, estimated percentage "counts" can be determined by using sales increases from the percentage numbers. Based on the actual percent increase from baseline-2 to intervention-2 of salad sales (10 %), and salad "counts" (5%), a 2:1 ratio was estimated for calculation. These numbers, presented in Table 4, are probably conservative estimates, as there was a sudden surge in temperature during baseline-2. Thus, based on the estimated percentage "counts" of salads sold, there was a 3.5% increase for intervention-1 and 5% increase for intervention-2. Also, based on these estimates, salad sales during baseline-2 could have been as high as 21.5%, but were only 19%. This supports the results of the sales data which indicate that salad sales at the intervention site decreased upon withdrawal of the prompts.

Table 4
Actual and Estimated Salad Percentage "counts"
Based on actual % increase in salad sales and counts

	Phase			
	B-1	I-1	B-2	I-2
Actual % sales	7.2	7.7	8.1	9.0
% increase		7.0	5.0	10.0
Actual % count		19.0	19.0	24.0
Est. % count	15.5	19.0	21.5	24.0

In addition, it should be noted that a behavioral measure of this type could provide a dependent measure to augment that of the computerized cash register system (e.g., male versus female response to the intervention, etc.).

Population Description

The customer population at the intervention site was 52% male and 48% female; 10% age 0-17 years, 69% age 18-39 years; 13% age 40-65 years, and 8% age 66+ years; and 94% Caucasian, 2% Black, 0% Hispanic, and 4% Asian. Customer demographics including gender, age, and race for weekday versus weekend and lunch versus dinner are presented in Table 5. Approximately 74% of the customers surveyed reported that they knew what they would order before they arrived. Survey information for weekday versus weekend and lunch versus dinner is presented in Table 6 (e.g., a higher percentage of customers reported that they knew what they would order during weekend lunches). Customers reported that 11% ate at the restaurant more than once per week, 33% ate there about once per week, 50% ate there once per month, and 6% other. Survey information for weekday versus weekend and lunch versus dinner is presented in Table 7 (e.g., a higher percentage of customers during weekday lunches report being repeat customers). Thus, many customers know what they will order, and visit this restaurant frequently. Also, customers may visit this

Table 5
Demographics of Customer Population

Category	Weekday		Weekend		
	Lunch	Dinner	Lunch	Dinner	
<u>SEX</u>	Male	57%	55%	50%	50%
	Female	43%	45%	50%	50%
<u>AGE</u>	0-17	9%	12%	17%	9%
	18-39	67%	74%	61%	80%
	40-65	21%	13%	18%	8%
	66+	2%	1%	4%	3%
<u>RACE</u>	Caucasion	93%	94%	96%	93%
	Black	3%	3%	1%	2%
	Hispanic	0%	0%	1%	2%
	Asian	4%	2%	3%	5%

Table 6
Percentage of customers who know what
they will order before arrival

<u>Weekday</u> <u>Lunch</u>	<u>Weekday</u> <u>Dinner</u>	<u>Weekend</u> <u>Lunch</u>
71%	69%	89%

Table 7
Percentage of Customer Frequency For Days and Meals

Frequency	Weekday		Weekend	
	Lunch	Dinner	Lunch	Dinner
1/Month	36%	50%	56%	56%
1/Week	41%	31%	31%	30%
More Than 1/Week	13%	13%	11%	8%
Other	9%	6%	3%	6%

restaurant during work lunchbreaks. Finally, weekend lunch customers may have more pre-selection knowledge than customers during other meals.

Cost Analysis

Material costs included production and reproduction of the posters and table tent cards. Each poster (2 total) was produced in three hours ($3 \times \$25.00 \times 2 = \150.00), and each master copy for the (a) table tent cards and (b) decorative streamer bows was produced in one hour ($2 \times \$25.00 = \50.00); thus, the cost of graphics was \$200.00. The cost of supplies, which was approximately \$10.00, included poster board, markers, and glue. The table tent cards copying cost was approximately \$5.00. Thus, the total cost of materials was only \$215.00.

Cost of measurement included time spent making in-store observations (approximately 5 hours), designing the measurement system (approximately 5 hours), recording data (9 hours), obtaining data from the restaurants (9 hours), preparing the measurement sheets and questionnaires (1 hour), administering questionnaires (108 hours), completing in-store "counts" (10 hours), and meeting with research assistants and store managers. The cost of measurement was about \$1375.00, based on \$10.00 per hour for the investigator and \$5.00 per hour for research assistants. The total cost (materials and measurement) was approximately \$1600.00.

However, since the prompts can be reproduced at minimum cost, and the research data collection may not be necessary to achieve the effects found in this study, a rough cost-analysis can be calculated using the materials costs alone. Percent measures, as well as actual increases in salad sales, can be used. Based on a mean of about 500 customers per day, spending a mean of \$3.50 each, and a mean percent increase in salad sales of 13.5% during four weeks of prompting (15% x 3 weeks; 9% x 1 week), it was estimated by management that salad sales per day increased by a mean of about 35. Therefore, across the four weeks (28 days) of prompting, about 980 more salads (at a cost of \$1.39 for a side salad and \$2.49 for a salad bar) were bought for the \$215.00 for materials. Therefore, the cost for each added salad bought during the intervention was about \$.22 (i.e., $\$215.00 \div 980$). Thus, the cost to raise the percent of salad sales, each percent, across the four weeks was about \$16.00 ($\$215.00 \div 13.5\%$).

Discussion

General Statement about the Results

The results of this study indicate that the use of prompts in a fast-food restaurant successfully influenced customer choice of one low-fat, high-fiber selection. Visual inspection of the graphical representations of sales data using a correction procedure (Winett, et al., 1985)

shows that the percent of salad sales (side salad and salad bar selections) in Blacksburg increased with the introduction of a nutrition promotion message, decreased upon withdrawal, increased again with the reinstatement of the intervention, and decreased again upon withdrawal (i.e., follow-up). This was true of salad sales separately and combined. Other entrees (e.g., taco salad, special hamburger, and single hamburger selections) did not, upon visual inspection, appear to systematically increase and decrease with the introduction and withdrawal of the salad intervention (multiple prompts directed toward increasing salad bar and side salad selection purchases).

It was estimated that approximately 1000 more salads were sold as a result of this intervention. If an increase in salad sales did not decrease sales of other items, but generally increased overall sales, then a profit of \$1.00-2.00 per salad would be obtained. For example, if a customer spent \$1.39 on a side salad, this new purchase would gross the restaurant \$1.19 (i.e., $\$1.39 - .20 = \1.19).

Temperature during this project was variable. Although Radford was used as a comparison base to control for the effects of temperature, a visual inspection of the daily points indicates variability. Thus, the success of prompting may still depend to some extent on weather or season.

An ANOVA of the customer questionnaire, questions one and two, yields results which indicate an interaction for treatment (baseline versus intervention) x day (weekday versus weekend). Thus, consumers' self-report may be influenced by the introduction or removal of a health promotion message depending on whether it is a weekday or weekend. Also, the prompts used in this study may have been more salient than the in-store advertisement poster. This provides further support for incorporating formative and pilot research into field study projects.

Percentages of dollar sales were recorded for several entrees. Visual inspection of lunch and total day percentages indicates no great differences between these data.

Other data indicated that the population of this Blacksburg fast-food restaurant was approximately equal by gender, primarily 18-39 years old, and primarily Caucasian. It was also found that the majority of customers in this location have pre-selection knowledge, and approximately 44% of the customers choose to eat in this location at least one time per week.

Implications for Health Promotion

This study demonstrated the success of using a simplified approach to create behavior change in a fast-food restaurant, which is especially important given the high rate of eating in restaurants in America. It is an

extension of previous interventions and further supports the notion that large-scale health prevention may be an achievable goal. Interventions of this nature provide an efficient means of reaching a large number of individuals with the goal of potentially reducing coronary heart disease, hyperlipidaemia, atherosclerosis, diverticular disease, various types of cancer, obesity and dental decay.

It appears that this method could be used to influence different populations in different kinds of locations. Further, the relatively low cost for increasing salad sales (e.g., \$16.00 for each percent increase in salad sales across the four weeks), also should make this type of intervention attractive to health promotion professionals and corporations. In addition, it was encouraging that the posters were accepted by this fast-food restaurant. Thus, it is possible that a similar intervention would be accepted for more extensive commercial and health promotion uses.

Limitations of This Project

Although field research is exciting, projects must be completed under the existing constraints, which may prove to be frustrating. In this study, several desired analyses were not completed due to limitations which were beyond the control of the investigator. As previously noted, the management did not provide dollar sales figures as planned. Furthermore, the decision to report percentages only, and

not dollar sales, was made after the baseline measurement was completed. As a result, evaluations of change by quantity (which were to be determined using the dollar amount of sales for an entree divided by price) were not possible. In addition, an analysis (using a t-test) of salad consumption at lunch as compared to dinner was desired, but not possible. This comparison would have provided information about the effectiveness of prompts by meal (i.e., lunch versus dinner). It was not possible since the evening percentage included lunch and dinner sales combined, and the dinner sales percentage could not be separated from this combination figure.

Salad "counts" were begun in response to the management's decision to provide only percentages; thus, a baseline "count" was lacking which made using this evaluation measure, at best, speculative. However, as discussed above, the potential for this kind of measurement is evident. Finally, increases and decreases of sales may be conservative estimates of impact since the data included sales from the "drive-thru" window (prompts were only located inside the restaurant).

Recommendations for Future Research

This project utilized the computerized cash register system of the restaurant. Although a complete data set was not obtained, it did provide for a quick, accurate, and objective measure. Future research should continue to use

computerized cash register systems and intervene with and track multiple menu items. Also, Salad Bar and Side Salad sales should be evaluated separately. Also, the effects of this strategy during different seasons using different variations of a multiple baseline design should be evaluated.

Questionnaire and survey results may help to guide the design of future projects. For example, it is evident from the results of question 3 of the customer questionnaire that the prompts used in this project during intervention were more salient than the in-store advertisement noted during baseline measurement. Thus, formative and pilot research can provide useful information about successful physical and psychological positioning of prompts. Also, based on the fact that so many customers have predetermined choices, a future direction might be to utilize this information in a campaign directed towards this change (e.g., "Rethink your choice").

Future research is needed to:

1. Evaluate the effects of procedural aspects, such as different techniques (e.g., use of prompts) or strategies (e.g. promoting a "healthy" entree versus a meal addition).
2. Foster longer term behavior change.

3. Evaluate the introduction of prompts for "healthy" items separately versus jointly (e.g., consider a campaign which focuses on low-fat items, generally, with the promotion of a different specific item each week).
4. Design and evaluate the implementation of an integrated campaign, one which includes promotion by media, coupon, and in-store approaches.

Summary

This study investigated a method to promote one low-fat, high-fiber choice in a fast-food restaurant. The intervention was directed toward influencing customers through a simple visual and print message, based on themes derived from formative and pilot research, to choose a healthy entree or add a healthy item to their meal. The prompts used in this study specified the salad bar and side salad selections. It was conducted in a national chain fast-food restaurant in Blacksburg, Virginia. An identical restaurant in the neighboring town of Radford, Virginia, was used to provide no-treatment comparison data. An A-B-A-B reversal design was used. A one-month follow-up phase was included in the design. Daily and weekly sales percentages of entree items were obtained from the existing computerized system (item dollar sale divided by total dollar sale).

A correction procedure was used to graphically represent sales data of several entrees (i.e., salad bar, side salad, salads-combined, special hamburger, single hamburger, and taco salad selections). For salads, across phases, increases in the corrected percent of salad sales were shown with the introduction of the prompts, and decreases (return to baseline or below) were shown when the prompts were removed. Data for the taco salad, special hamburger, and single hamburger selections, selections not represented by associated prompts, indicate that sales did not increase and decrease systematically with the introduction and withdrawal of the intervention.

This study is an extension of previous research and demonstrates the success of a simplified approach to create behavior change. This further supports the notion that large-scale health prevention may be an achievable goal. Research projects should continue to use computerized cash register systems which provide an objective, quick, and accurate measure. Future research is needed to evaluate the effects of procedural aspects, longer term behavior change, and more multifaceted approaches.

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Appendices

Appendix A



VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DEPARTMENT OF PSYCHOLOGY
(703) 961-6581

October 13, 1986

Mr. Chris Martin
Wendy's Old Fashioned Hamburgers
701 North Main Street
Blacksburg, VA 24060

Dear Mr. Martin:

This letter regards written confirmation of plans for the nutritional promotion project, as we discussed on Friday, October 3. The meeting, attended by yourself, Ralph Mills, Richard Winnett, Ph.D., and myself gave verbal confirmation of the project.

For my Master's Thesis, I plan to implement a nutritional promotion program which will attempt to encourage people to eat a selected item. I am interested in behavior change with low-fat, high-fiber foods; therefore, the selected item might be a salad or baked potato. Prior to the start of the project, I anticipate collecting some background data, such as observations of customers' choices, or simple analysis of past selection percentages. Specific plans for the project will be finalized after the initial data and discussion are completed between us. It is also important that I familiarize myself with your computerized cash register system before finalizing plans for the study.

Tentative plans were discussed at our meeting. It is possible that a brief message will be displayed on a poster. Of course, this should not interfere with the existing Wendy's advertisements. I will be in contact with you about the final plans for the project. It may be implemented between January and April, 1987. During the entire duration of the project, I will be collecting sales data from your computerized system. In addition, plans include obtaining comparison data from the Radford Wendy's Old Fashioned Hamburgers Restaurant.

Most importantly, I will obtain your approval for everything related to this nutritional promotion project as the project progresses. This includes all materials, and all forms of research, such as time, place, and content of any interaction I might have with your customers, etc. This also includes any information I provide to outside agencies at the close of the project.

When completed, I plan to inform the local media of Wendy's cooperation as well as some of the tentative results. All information will first be presented to you for comments. It is my intention that this publicity help promote the business of your restaurant.

Thank you for your time and cooperation. I would appreciate having a signed copy of this letter returned to me as soon as possible. I look forward to working with you and on the successful completion of the nutritional promotion project!

Sincerely,

Jana L. Wagner

clk



COLLEGE OF ARTS AND SCIENCES

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DEPARTMENT OF PSYCHOLOGY
(703) 961-6581

February 4, 1987

Mr. Ralph Mills
Blacksburg Wendy's
Old Fashioned Hamburgers
701 North Main Street
Blacksburg, VA 24060

Dear Mr. Mills:

I have been very pleased to be working with Wendy's Restaurant for my Master's Thesis. Everyone has been supportive of my project to attempt to increase salad sales by the introduction of a simple message on a colorful poster. I was dismayed to discover this morning that there is some concern about my experiment. I, and the Department of Psychology at Virginia Polytechnic Institute & State University, can assure you of confidentiality of these sales figures, as I only want to track a percentage change of salad sales. I would not use the Wendy's name without being granted the proper permission in any communication, written or verbal. I hope that this will be acceptable to you.

However, in the event that this is not acceptable, I would like to offer an alternative for you to consider. I would be happy to receive only the percentage figures of salad and hamburger sales. This would ensure you confidentiality of net sales figures and provide me with enough data to successfully complete my thesis. If none of the above alternatives are acceptable, would you please consider allowing me to continue my experiment by being in the establishment and making one-hour observations to count the number of customers and number of salads sold. Again, I would assure you complete confidentiality.

Your attention to this matter is sincerely appreciated. I hope we can continue our cordial relationship.

Sincerely,

Jana L. Wagner, B.A.
Thesis Candidate

Richard A. Winett, Ph.D.
Professor
Associate Department Head and
Director of Graduate Studies

clk
xc: Chris Martin

Appendix B

Be Fit & Healthy;



**Eat a low-fat SALAD as your
meal or add a side salad.**

Appendix C

CUSTOMER QUESTIONNAIRE

REVERSAL	<u>YES</u>	<u>NO</u>
1. I eat nutritious foods most of the time	Y	N
2. I think low-fat foods are healthy	Y	N
3. I noticed the "Big Classic" advertisement poster	Y	N
4. I looked at the advertisement poster for several seconds	Y	N
5. I like the message on the "Big Classic" poster	Y	N
6. The advertisement poster influenced my choice	Y	N
7. A message about nutrition would influence my selection	Y	N
8. I would choose a salad if I was told it was healthy	Y	N
9. I will choose to eat a salad the next time	Y	N
10. I will frequently buy a salad in the future	Y	N
11. The most important reason I will choose to eat a salad is because salads are nutritious	Y	N

CUSTOMER QUESTIONNAIRE

INTERVENTION	<u>YES</u>	<u>NO</u>
1. I eat nutritious foods most of the time	Y	N
2. I think low-fat foods are healthy	Y	N
3. I noticed the "BE FIT AND HEALTHY" salad posters	Y	N
4. I looked at the salad posters for several seconds	Y	N
5. I think the salad poster is appealing	Y	N
6. The nutrition poster influenced my choice	Y	N
7. A message about nutrition would influence my selection	Y	N
8. I chose a salad because I was told it was healthy	Y	N
9. I will choose to eat a salad the next time	Y	N
10. I will frequently buy a salad in the future	Y	N
11. The most important reason I will choose to eat a salad is because salads are nutritious	Y	N

Appendix D

NUTRITION PROJECT RECORDING SHEET

Week: _____

<u>DAY</u>	<u>ITEM</u>	<u>PERCENTAGE</u>
SUN.	SIDE SALAD	
	SALAD BAR	
	CLASSIC	
	SINGLE HAMB.	
	TACO SALAD	
	POTATO	
	CHILI	
MON.	SIDE SALAD	
	SALAD BAR	
	CLASSIC	
	SINGLE HAMB.	
	TACO SALAD	
	POTATO	
	CHILI	
TUES.	SIDE SALAD	
	SALAD BAR	
	CLASSIC	
	SINGLE HAMB.	
	TACO SALAD	
	POTATO	
	CHILI	

WED.

SIDE SALAD
SALAD BAR
CLASSIC
SINGLE HAMB.
TACO SALAD
POTATO
CHILI

THURS.

SIDE SALAD
SALAD BAR
CLASSIC
SINGLE HAMB.
TACO SALAD
POTATO
CHILI

FRI.

SIDE SALAD
SALAD BAR
CLASSIC
SINGLE HAMB.
TACO SALAD
POTATO
CHILI

SAT.

SIDE SALAD
SALAD BAR
CLASSIC
SINGLE HAMB.
TACO SALAD
POTATO
CHILI

PERCENTAGE SALE

WEEKLY TOTAL

SIDE SALAD

SALAD BAR

CLASSIC

SINGLE HAMB.

DOUBLE

TRIPLE

CHILI

TACO SALAD

POTATOES:

broccoli & cheese

chili & cheese

sour cream & chives

bacon & cheese

cheese

Appendix E

ANOVA TRANSFORMATION FORMULA

Customer Questionnaire Data

Proportion = $\frac{\text{number of yes responses}}{\text{total number of responses}}$

$Y = \text{arc sine} (\text{sqrt} (\text{proportion}))$

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PROMOTING ONE LOW-FAT, HIGH-FIBER CHOICE
IN A FAST-FOOD RESTAURANT: USE OF
POINT-OF-PURCHASE PROMPTS

by

Jana Louise Wagner

Committee Chairperson: Richard A. Winett

(ABSTRACT)

This research project investigated a method to promote one low-fat, high-fiber choice in a national chain fast-food restaurant. It is an extension of efforts toward large-scale dietary change. A procedural extension of a prompting strategy was used in an attempt to influence customers to choose a salad. A simple visual and print message based on themes derived from formative and pilot research at the restaurant was presented during two intervention phases of a reversal design. The message, "Be Fit and Healthy; Eat a Low-fat SALAD as Your Meal or Add a Side Salad," was displayed in colorful posters and tent cards which were placed on all the tables. Data from a comparison base in a neighboring town were obtained. A one-month follow-up phase was included in the design. Prices and in-store advertisements were identical in

both locations. The existing computerized cash register system was used to obtain accurate, objective data.

Daily and weekly sales percentages of several entrees were obtained. Results of analysis using a correction procedure indicate that when graphically represented, salad sales across phases increased with the introduction of the prompts, and decreased with their removal. In addition, three entrees not represented by associated prompts remained stable across phases. For Salads-combined, results indicate that sales increased about 15 % and 9 %, respectively, for the first and second intervention phases. Daily temperature during this project was variable. Although a comparison site was used to control for the effects of weather, results indicate that salad prompting may have increased sales more during warmer temperature.

Population demographics were recorded. Analyses of the customer population during this project indicate customers were about equal by gender, and consisted primarily of white, 18-39 years old individuals. The cost for each added salad bought during the intervention was about \$.22, and the cost to raise the percent of salad sales, each percent, across the four weeks was about \$16.00. Future research should attempt to foster longer term behavior change and integrate multifaceted promotions.