

## Individual and Community Models for Dietary Behavior Change

KAREN GLANZ AND MICHAEL P. ERIKSEN<sup>1</sup>

Department of Health Education, Temple University, Philadelphia, Pennsylvania; and

<sup>1</sup>Office on Smoking and Health, Centers for Disease Control, Atlanta, Georgia

### INTRODUCTION

In the past few years, the challenge of changing dietary behavior to reduce the risk of chronic disease has become increasingly compelling to health professionals and nutrition educators. The cumulative weight of epidemiological, animal, and clinical research has led to the release of landmark reports by authoritative government and scientific organizations that include remarkably similar dietary recommendations for health maintenance and enhancement (1-4). During this time, the use of health promotion interventions to promote dietary behavior change has gained momentum. For nutrition education to be effective, practitioners and researchers need both to understand health behavior related to nutrition and to transform that knowledge into useful strategies for health enhancement. Designing interventions to yield desirable eating pattern changes can best be done with an understanding of relevant theories of dietary behavior change and an ability to put them into practice (5). A theory-based approach can both guide program development and provide a foundation for the evaluation of impact and the identification of weak spots.

However, most nutrition education intervention programs and published nutrition education research reports do not cite a particular theory or model as a basis for practice or research (6,7). While more theoretically-informed work is beginning to emerge, a significant gap remains both in familiarity with theory and in the ability to apply theories among practitioners and researchers in nutrition education (8-10).

This article illustrates the application of four interrelated theoretical models of health behavior in nutrition intervention as part of a worksite cancer control study with rural energy workers. It also discusses the unique features of eating behavior that must be considered in applying theories of health behavior to nutrition for chronic disease control.

The dual aims of this paper are to communicate the adaptation of behavioral science theories to improve human nutrition and to demonstrate their viability in developing effective community interventions.

### APPLICATION OF THEORETICAL MODELS IN WORKSITE NUTRITION PROGRAMS

Worksites are an important setting in health education and risk reduction programs. The workplace provides many opportunities for reinforcement and environmental support for health promoting behaviors. Program convenience, social support from co-workers, and existing communication networks can facilitate program implementation and effectiveness. Worksites enable programs to reach large groups, thus making a greater public health impact possible. Nutrition programs at the workplace offer the opportunity to reach adults in group dining situations, to follow up, and to reinforce messages over time (8,10,11).

This section discusses the application of four theoretical models — 1) Consumer Information Processing, 2) Stages of Change, 3) Social Cognitive Theory, and 4) Diffusion of Innovations — to nutrition education in a cancer control study of rural energy workers. The specific integration of these theories was accomplished during the planning phase of a large multi-center field experiment currently in progress (12,13). The focus of this article is mainly on description and an analysis of the nutrition intervention scheme in a unique workplace environment, rather than on research design and methodology. This example should be of interest to both practitioners and researchers, because it illustrates the translation of conceptual frameworks into practical strategies in a real-world setting.

The first section will describe the context of the worksite health promotion project for rural energy workers, and then provide an overview of the nutrition intervention component. Next, examples of strategies informed by each of the four theoretical models are given, followed by a demonstration of how the various frameworks are integrated through three levels of a worksite health promotion intervention.

Address for Correspondence: Karen Glanz, Ph.D., M.P.H., Department of Health Education, 304 Seltzer Hall, Temple University (062-56), Philadelphia, PA 19122; (215) 787-5109.

*Context: Worksite Health Promotion for Rural Energy Workers*

**Overview of rural energy workers project.** The rural energy workers project is a randomized, prospective field experiment with 40 worksites (20 experimental, 20 control) and over 7,000 workers. It is part of the Working Well project, a five-year cooperative agreement funded by the National Cancer Institute to test the effectiveness of worksite health promotion interventions in achieving individual and organizational changes to reduce cancer risk (13). The study includes companies and workers with broad geographic and industrial diversity.

The rural energy workers project is implementing and testing nutrition and tobacco control interventions among rural energy workers in 11 Southern states. The workers represent four natural gas pipeline companies and twenty rural electrical cooperatives. They are predominantly male (approximately 83%), mostly white, rural, in blue-collar occupations, and largely non-unionized. Their jobs involve the transmission (but not the production) of natural gas and electrical energy to rural locations, and related office and clerical functions.

Each worksite employs between 100 and 600 workers. Many of these energy transmission workers spend most of their working hours outside the physical "home office," coming to a central location mainly to receive their work assignments. The usual eating facilities are limited to a lunchroom with refrigerator, microwave oven, tables and chairs, and vending machines. On-site food services are rare at these rural sites.

Due to their location, subcultures, and access to health care, these workers are often at higher risk for chronic diseases than their urban, white-collar counterparts (14-16). They also tend to have fewer resources for health education and health promotion (17). Rural and blue-collar populations tend to be extremely family centered and often choose to live near extended family (18,19).

Although data regarding the eating habits of male blue-collar workers are limited, these workers appear to engage in more high-risk eating practices than do females or their white-collar counterparts. In general, men have been found to eat more fat and less fiber than women (20), and they are less likely to report making alterations in their dietary behaviors for health reasons (21).

The population of rural energy workers in this project has had little prior exposure to health promotion programs. Multiple strategies tailored to this environment and these workers are necessary for effective health behavior change.

**Overview of nutrition intervention.** The central objective of the nutrition intervention is to decrease dietary fat intake to no more than 30% of calories, and to increase the intake of dietary fiber to 20-30 grams or more per day. These objectives are based on the NCI Dietary Guidelines (4). They are also consistent with nutrition recommenda-

tions for general good health and for the reduction of chronic diseases other than cancer, including cardiovascular diseases and diabetes mellitus (1-3). Thus, nutrition education strategies include materials and activities related to healthful eating generally and to the prevention of other chronic illnesses.

The translation of the NCI Dietary Guidelines into food recommendations is the basis for the message content of the nutrition interventions. These "eating pattern messages" emphasize eating less red meat and fried foods, choosing low-fat dairy products, reducing added fats in cooking, and consuming more whole grains, starches, legumes, fruits and vegetables (10,22).

The health promotion interventions designed to achieve nutrition goals in this project are theoretically based and stage-specific, and are being delivered at the organizational, environmental, and individual levels (8,10,12). Certain activities relate to multiple theoretical perspectives. Some of the theories overlap with each other in their program implications. The focus here is on the nutrition component of the project; however, of necessity, some of the environmental and organizational interventions cut across cancer control content areas.

*Strategies Informed by Each Theoretical Model*

For health and nutrition education interventions to be effective, they must be targeted not only at individuals, but must also affect interpersonal, organizational, and community factors (23). For this research, four theoretical models that are particularly useful for understanding the determinants of dietary behavior and the processes of changing eating patterns to reduce chronic disease risk were identified. They include theories at the intrapersonal, interpersonal, and community or macro levels. The first three models — Consumer Information Processing (CIP), Stages of Change, and Social Cognitive Theory (SCT) — deal with the role of people's thoughts and judgments (called "cognitions"), and how these cognitions influence their health behavior. The fourth model, Diffusion of Innovations, concerns how nutrition educators can more effectively spread the adoption of new, healthier eating habits within a community (24).

**Consumer information processing.** From a CIP perspective, consumer decision making is a multi-stage process of information acquisition and evaluation, decision making, use, and learning (25,26). A central premise of CIP Theory is that individuals can process only a limited amount of information at one time (26). Concepts from CIP can improve nutrition educators' abilities to provide useful nutrition information for making healthful food choices (25,27). Fidelity to CIP concepts can help to match the most effective type, format, and quantity of information with a specific population.

All aspects of the worksite nutrition intervention that include informational content are influenced by CIP concepts. The translation of the project's nutrient-related goals (i.e., eat less fat and more fiber) into eating pattern messages is a central application of CIP. CIP is most often applicable in individual-level interventions, but also enters into environmental interventions such as the kick-off events used to promote awareness of a program. Throughout the nutrition education activities and materials, the main emphasis is on "how-to" or *instrumental* information — what, how, when and how much — rather than on the "why" (for example, the biological processes by which nutrition affects health).

Most of the rural energy workers in this project are high school graduates. Print materials are being selected or designed at their reading level or less, and new materials will be pre-tested on similar working populations. The emphasis is on providing clear, simple, relevant information, and providing illustrations through pictures, slides, and videos to reinforce basic concepts such as portion size and added/invisible fats.

Print nutrition information materials will be portable and convenient. For vending machines, recommended choices will be labeled with a simple symbol, providing the equivalent of a point of choice identifier for specific food items. The project includes plans to work with nearby food outlets to identify and endorse low-fat and high-fiber selections with point of choice information.

**Stages of change.** The stages of change model proposes that people are at various points along a continuum of change-readiness: *precontemplation* (unaware, not interested in change); *contemplation* (thinking about changing); *decision* (being determined to change); *action* (actively modifying habits and/or environment); and *maintenance* (maintaining the new, healthier habits) (28). This model is consistent with the overall sequencing of interventions, in which initial activities emphasize awareness and motivation, followed by opportunities for action, and later promoting maintenance of change (13). Activities are being phased in over time so that a greater proportion of workers is receptive to the behavior change initiatives introduced at each point in time.

At the individual level, structured self-help guides are being developed that are based on the stages model: Individuals can complete a series of questions that will identify their stage (precontemplation, contemplation, decision, action, or maintenance) and then direct them to information about nutrition and dietary change strategies that are (1) appropriate for their current stage and (2) likely to move them to the next stage of adopting improved eating patterns. Supportive activities for family members are being built into these materials, to enhance social support and reduce barriers to readiness for active change.

Another individual-level intervention, telephone counseling and feedback, is available alone and as an enhancement to the self-help guide. An important function of the

telephone counseling will be to help those who "recycle" (i.e., revert to a previous stage) to get back on track and progress toward dietary change goals.

**Social cognitive theory.** The overarching construct of *reciprocal determinism* (29), emphasizing the dynamic interactions between personal factors, environment, and behavior, is the foundation for including organizational, environmental, and individual level interventions. The environmental and organizational interventions help create a setting conducive to healthy change. Individual level interventions complement these interventions by focusing on promoting cognitions and behaviors for healthful eating in individual workers.

Some other key concepts of Social Cognitive Theory (SCT) that apply to the worksite nutrition program are: observational learning, environment, self-control, self-efficacy, and reinforcement (8,12,30,31). Site coordinators participated in a two-day training program with coordinators from other locations, to enhance their observational learning and build self-efficacy in their ability to organize site intervention activities. In turn, they act as role models to workers after returning to their home sites.

In another use of the concept of modeling, periodic project newsletters include examples of workers who have succeeded in making health-enhancing changes. The project team is developing a series of six tailored videotapes that show actual rural energy workers demonstrating healthful food preparation skills and discussing strategies that have helped them improve their eating patterns. This can enhance observational learning.

Self-help materials with goal-setting activities (self-control), and behavioral contracting (self-control, reinforcement, self-efficacy) are part of individual and small group nutrition education activities. The use of safety meetings for periodic nutrition information updates can enhance environmental support for healthful eating. Resource centers at most locations make nutrition information more accessible, and group educational activities provide support for the workers most interested in intensive learning opportunities. Some employee committees are working on adding more healthful food choices to vending machines at their sites.

An incentive program (reinforcement) has been developed to encourage participation in the program and promote adoption of healthful eating practices. Employees may sign up to receive coupon books, and the coupons are used to obtain items such as baseball caps, magnets, pens, sports bottles, and insulated cup holders imprinted with the program logo. If they prefer, employees can enter their "used" coupons in drawings for cash prizes at each site. The incentive program is designed to continue throughout the entire program (about thirty months).

**Diffusion of innovations.** In order for changes to really "take root," informal and formal social groups and organ-

izational structures must be receptive to changes in individuals and the environment (32,33). Before beginning the intervention, a fundamental concept from Diffusion of Innovations was applied by the selection of optimal settings for introducing the program. This was operationalized by obtaining corporate level support for participation at each worksite. A major gas pipeline company with which the sponsoring institution had an existing health promotion collaboration assisted in recruiting the other gas pipeline companies to participate. Similarly, the national organization for electric cooperatives, the National Rural Electric Cooperative Association (NRECA), actively assisted in recruiting the electric cooperatives. Thus, the participating sites were recruited through natural diffusion channels and were favorably predisposed to participate in the project, in line with the diffusion concept of selecting optimal settings for introducing an innovation. (Because recruitment of companies and a baseline survey preceded randomization into experimental and control conditions, treatment and control sites do not differ on this factor.)

At the beginning of the health promotion intervention, the first organizational strategy based on diffusion principles involves naming a site coordinator and establishing an Employee Advisory Board at each worksite location (10). The coordinator and committee are the concrete expression of organizational commitment to health promotion. They are selected partly on the basis of their predicted effectiveness as opinion leaders (i.e., respected individuals and peers) for their co-workers. Site coordinators play a pivotal role in tailoring the basic package of interventions to a given site, by making the interventions as compatible, advantageous, low risk, and beneficial as possible to the site employees. These characteristics of innovations increase their chances of being widely adopted (24,32).

Environmental level interventions include worksite-wide kick-off events and on-site health information resource centers. These strategies occur during the first year, and provide nutrition activities and information resources. They are aimed primarily at the awareness and interest stages of the adoption process. Later during the intervention period, environmental strategies include the seasonal introduction of sample "Healthy Snacks to Go" that workers can take with them when they work outside the home office. The snack packs include information comparing the nutritional value of the samples (e.g., apple and whole wheat crackers) with snacks that might be more typical for rural energy workers (e.g., potato chips, candy bars).

## DISCUSSION

The nutrition intervention plan of the project is embedded in an ecological perspective for health promotion (23); it addresses individual, environmental, and organizational level factors influencing dietary behavior. The organiza-

tional level of intervention establishes the on-site context for health promotion through employee involvement. Environmental level interventions reach all workers, create opportunities for healthful eating, and reduce barriers of nutrition knowledge and access to nutritious food. Individual level interventions are available for workers who are interested and, over time, motivated to acquire new information or to participate in action-oriented activities for healthful eating. Table 1 presents the integration of strategies aligned with various levels of intervention.

Several features of this worksite nutrition intervention are worth emphasizing for their practical value over and above theoretical relevance. First, while interventions are delivered at the worksite, they have been designed to require only a moderate amount of work time and few group meetings. This is essential because of the nature of the workforce. These employees meet in groups only for training, monthly safety meetings, and special company events.

Next, the program is designed to build in intensity over a two and one-half year period and not be a short-lived "flash in the pan". This is particularly relevant to the self-help model for individual behavior change (8,10-12). It is practical for this audience because it does not require full time on-site professionals, and can be managed from a distance by a central intervention staff.

This model is not being operationalized as a set of discrete theory-based activities, existing separately but delivered to the same worksites. Rather, the theoretical bases overlap and converge into an integrated model (Table 1). Identifying the theoretical foundations for successful nutrition intervention emphasizes their usefulness and assures that they are kept in mind as the program design and delivery moves ahead. Thus, it should be possible to identify weak spots along the way and at the end of the program. This is important, because the project team believes that this worksite nutrition model is easily replicable and will generalize readily to other worksite settings.

The adaptation of health behavior theories to nutrition-related behavior should be made with close attention to the unique characteristics of eating habits and associated health risks, and practical issues in the food environment. Most diet-related health problems develop gradually, do not present immediate or dramatic symptoms, and are not targets of social stigma. For food habits such as the high intake of fatty foods and salt, or the low intake of high-fiber foods, there is probably little psychodynamic "baggage," little experience of immediate physical reaction following excess consumption, and limited social pressure to change.

Dietary behavior change for chronic disease risk reduction is typically qualitative, with the goal being a change in the nutrient composition of the diet rather than merely cutting back; "quitting" is neither possible nor desirable. Food habits develop gradually and have many individual, social, cultural and economic determinants. Legislative and

Table 1. Integration of theoretically informed nutrition intervention strategies.

<i>Consumer Information Processing</i>	<i>Stages of Change</i>	<i>Social Learning Theory Processes</i>	<i>Diffusion of Innovations</i>	<i>Levels of Intervention</i>
		Organizational support and commitment	Selecting optimal setting for introducing the innovation	Organizational Environmental
Visible, attention-getting information	Increasing awareness of early stage workers Alerting action stage workers	Demonstration of need for change Worker involvement Information and persuasion	Creating preconditions for change	Organizational Environmental Individual
Strategic placement of information format and comprehension levels	Contemplation Action Recycling Maintenance	Instruction Modeling Mastery learning aids (self-help manuals) Self-efficacy enhancement	Implementing a demonstrably effective program	Environmental Individual
Clear, simple, relevant information Pictures to show actions	Moving resistant early stage toward action Recycling Maintenance	Modeling Vicarious modeling Diffusion through social networks, social support	Disseminating the innovation through successful examples	Organizational Environmental Individual

policy options to regulate the production and marketing of certain types of foods are more limited than they are for products such as tobacco, alcohol and other drugs (34).

To adopt new dietary recommendations, people must acquire a substantial body of knowledge (35) that may require a high level of cognitive ability and well-developed reasoning skills (36). Knowledge, while necessary, is not sufficient for healthful eating. However, misconceptions about the nutrient content of specific foods are quite prevalent, and incorrect information can lead even highly motivated people to make unwise food selections. Thus, practitioners need to be more attentive to how, when, and where nutrition information is provided than for some other health-related behaviors for which similar theoretical models have been applied.

## CONCLUSIONS

Theories of health behavior are useful because they enrich, inform, and complement the practical technologies of health education. For practitioners, the pragmatic criterion of *usefulness* of a theory is most important (37). This article has described the application of four theoretical frameworks

to a nutrition intervention to reduce chronic disease risk among rural energy workers: Consumer Information Processing, Stages of Change, Social Cognitive Theory, and Diffusion of Innovations. The frameworks form the basis for a 30-month worksite nutrition program to decrease intake of fat and increase the intake of dietary fiber in rural energy workers as part of a larger multi-center trial (12,13). They are integrated into an intervention plan that includes organizational, environmental, and individual level foci.

Effective nutrition education depends on using the most appropriate theory to inform practice in a given situation (5). For nutrition intervention for healthful eating in small rural worksites, the combined frameworks described in this article are both practical and likely to succeed.

## ACKNOWLEDGMENTS

This work was supported in part by a Cooperative Agreement from the National Cancer Institute, Grant No. CA-51671.

This paper is based in part on a presentation by Dr. Karen Glanz at the 118th Annual Meeting of the American Public Health Association in New York City, October 2, 1990.

The authors wish to acknowledge the following investigators on the M.D. Anderson Cancer Center project team who contributed to initial articulation of the conceptual framework for rural energy workers part of this study: Al Kondo, Ph.D., Carlo DiClemente, Ph.D., Guy Parcel, Ph.D., Jane Aaron, M.P.H., R.D.

The participating study centers and the respective Principal Investigators are: Brown University, David Abrams, Ph.D.; University of Florida, Jill Varnes, Ed.D.; Dana Farber Cancer Center, Glorian Sorensen, Ph.D.; University of Texas M.D. Anderson Cancer Center, Michael Eriksen, Sc.D. (1989-1991) and Bryant Boutwell, Dr.P.H. (1992); and Fred Hutchinson Cancer Research Center, James Grizzle, Ph.D. The Program Director is Jerianne Heimendinger, Sc.D., Division of Cancer Prevention and Control, National Cancer Institute.

The authors are indebted to these other members of the Working Well Nutrition Working Group's Intervention Subcommittee for their key role in developing concepts and methods of the core nutrition intervention: Mary Kay Hunt, R.D., M.P.H. (Subcommittee Chair); Mary Lynne Hixson, M.S., R.D.; Jerianne Heimendinger, Sc.D., M.P.H., R.D.; and Claudia Probart, Ph.D., R.D.

## NOTES AND REFERENCES

1. U.S. Department of Health and Human Services. *The Surgeon General's report on nutrition and health*. Washington, D.C., 1988.
2. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and your health: Dietary guidelines for Americans*, 3rd ed. Washington, D.C., 1990.
3. National Research Council, National Academy of Sciences. *Diet and health: Implications for reducing chronic disease risk*. Washington, D.C.: National Academy Press, 1989.
4. Butrum R.R., C.K. Clifford, and E. Lanza. NCI dietary guidelines: rationale. *American Journal of Clinical Nutrition* 48(Suppl), 1988.
5. Glanz, K., F.M. Lewis, and B.K. Rimer. *Health behavior and health education: Theory, research, and practice*. San Francisco: Jossey-Bass, 1990.
6. Smith, J.L. and L.M. Lopez. The application of theory and its relationship to program effectiveness in nutrition education research. *Journal of Nutrition Education* 23:59-64, 1991.
7. Sims, L.S. Nutrition education research: Reaching toward the leading edge. *Journal of the American Dietetic Association* 87, 9(Suppl):10-18, 1987.
8. Abrams, D.B., J.P. Elder, R.A. Carleton, T.M. Lasater, and L.M. Artz. Social learning principles for organizational health promotion: An integrated approach. In: *Health and industry: A behavioral medicine perspective*. M.F. Cataldo and T.J. Coates, eds. New York: John Wiley and Sons, 1986, pp. 28-51.
9. Glasgow, R.E. and J.R. Terborg. Occupational health promotion programs to reduce cardiovascular risk. *Journal of Consulting and Clinical Psychology* 56:365-373, 1988.
10. Sorensen, G., M.K. Hunt, D.H. Morris, G. Donnelly, L. Freeman, B.J. Ratcliffe, J. Hsieh, K. Larson, and J.K. Ockene. Promoting healthy eating patterns in the worksite: the Treatwell intervention model. *Health Education Research* 5:505-515, 1990.
11. Glanz, K. and T. Seewald-Klein. Nutrition at the worksite: an overview. *Journal of Nutrition Education* 18, 2(Suppl):1-12, 1986.
12. Heimendinger, J., B. Thompson, J. Ockene, C. Probart, J. Varnes, M.P. Eriksen, D.B. Abrams, S. Kinne, and G. Sorensen. Reducing the risk of cancer through worksite intervention. *Occupational Medicine: State of the Art Reviews* 5:707-723, 1990.
13. Working Well Study Group. Cancer prevention and control at the workplace: Overview of the NCI's Working Well Research Project. In review, 1992.
14. Schorr, V., D.A. Crabtree, D. Wagner, and P. Wetterau. Differences in rural and urban mortality: Implications for health education and promotion. *Journal of Rural Health* 5:67-79, 1989.
15. Wright, G.L. Health in rural America: Problems and recommendations. In: *New dimensions in rural policy: Building upon our heritage*. J. Jahr, P. Johnson, and M.A. Wimberly, eds. Washington, D.C.: Government Printing Office, 1986, pp. 461-469.
16. Preston, D.B. and P.K. Mansfield. Assessing the health status of rural people: An analysis of American studies, 1980-1985. *Advances in Health Education and Promotion* 3:241-287.
17. Connell, C. and C. Crawford. How people obtain their health information: A survey in two Pennsylvania counties. *Public Health Reports* 103:189-195, 1988.
18. Coward, R.T. and R.W. Jackson. Environmental stress: The rural family. In: *Stress and the family: Coping with normative transitions*. H.I. McCubbin and C. Figley, eds. New York: Brunner Mazel, 1983, pp. 188-200.
19. Flax, J.W., M.O. Wagenfeld, R.E. Ivens, and R.J. Weiss. Values and culture. In: *Mental health and rural America*. DHEW Publications No. (ADM) 78-753. Washington, D.C.: U.S. Government Printing Office, 1979, pp. 8-13.
20. Block, G., C.M. Dresser, A.M. Hartman, and M.D. Carrol. Nutrient sources in the American diet: Quantitative data from the NHANES Survey. II. Macronutrients and fat. *American Journal of Epidemiology* 122:13-26, 1987.
21. Food Marketing Institute. *Trends: Consumer attitudes and the supermarket*. Washington, D.C., 1988.
22. Potter, J.D., K.L. Graves, J.R. Finnegan, R.M. Mullis, J.S. Baxter, S. Crockett, P.J. Elmer, B.D. Gloeb, N.J. Hall, J. Hertog, P. Pirie, S.L. Richardson, B. Rooney, J. Slavin, M.P. Snyder, P. Splett, and K. Visnawath. The Cancer and Dietary Intervention Project: a community-based intervention to reduce nutrition-related risk of cancer. *Health Education Research* 5:489-503, 1990.
23. McLeroy, K., D. Bibeau, A. Steckler, and K. Glanz. An ecological perspective on health promotion programs. *Health Education Quarterly* 15:351-377, 1988.
24. Rogers, E. M. *Diffusion of innovations*, 3rd ed. New York: The Free Press, 1983.
25. Rudd, J. and K. Glanz. How individuals use information for health action: Consumer information processing. In: *Health behavior and health education: Theory, research and practice*. K. Glanz, F.M. Lewis, and B.K. Rimer, eds. San Francisco: Jossey-Bass, 1990, pp. 115-139.

26. Bettman, J.R. *An information processing theory of consumer choice*. Reading, MA: Addison-Wesley, 1979.
27. Roering, K.J., D.M. Boush, and S. Shipp. Factors that shape eating patterns: A consumer behavior perspective. In: *What is America eating? Proceedings of a Symposium*. Washington, D.C.: National Academy Press, 1986. pp. 72-84.
28. Prochaska, J.O. and C.C. DiClemente. Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research, and Practice* 19:276-288, 1982.
29. Bandura, A. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, 1986.
30. Perry, C.L., T. Baranowski, and G.S. Parcel. How individuals, environments, and health behavior interact: Social Learning Theory. In: *Health behavior and health education: Theory, research, and practice*, K. Glanz, F.M. Lewis, and B.K. Rimer, eds. San Francisco: Jossey-Bass, 1990. pp. 161-186.
31. Social Cognitive Theory (SCT) is the dominant contemporary formulation of Social Learning Theory (SLT). It is derived from earlier formulations of SLT by Rotter, Bandura, and others. Bandura adopted the new label of Social Cognitive Theory, or SCT, in his current version, which emphasizes the role of cognitions in behavior (see references 29 and 30).
32. Orlandi, M.A., C. Landers, R. Weston, and N. Haley. Diffusion of health promotion innovations. In: *Health behavior and health education: Theory, research, and practice*. K. Glanz, F.M. Lewis, and B.K. Rimer, eds. San Francisco: Jossey-Bass, 1990, pp. 288-313.
33. Goodman, R.M. and A.B. Steckler. Mobilizing organizations for health enhancement: theories of organizational change. In: *Health behavior and health education: Theory, research, and practice*, K. Glanz, F.M. Lewis, and B.K. Rimer, eds. San Francisco: Jossey-Bass, 1990, pp. 314-341.
34. Glanz, K. and R.M. Mullis. Environmental interventions to promote healthy eating: A review of models, programs, and evidence. *Health Education Quarterly* 15:395-415, 1988.
35. McCann, B.S., B.M. Retzlaff, A. Dowdy, C.E. Walden, and R. Knopp. Promoting adherence to low-fat, low-cholesterol diets: Review and recommendations. *Journal of the American Dietetic Association* 90:1408-1414, 1417, 1990.
36. Greidanus, I. and I. Contento. The relationship between the ability to solve practical nutrition problems in an adult population and Piagetian cognitive levels. *Journal of Nutrition Education* 21:73-81, 1989.
37. McGuire, W.J. A contextualist theory of knowledge: Its implications for innovation and reform in psychological research. *Advances in Experimental Social Psychology* 16:1-47, 1983.

#### HUNGER RESEARCH BRIEFING AND EXCHANGE

Sixth annual conference on Hunger Research Briefing and Exchange will be held April 14-15, 1993 at Brown University in Providence, Rhode Island. Jointly sponsored by the Alan Shawn Feinstein World Hunger Program at Brown University and Interaction, the American Council for Voluntary International Action, the 1993 Briefing will focus on the theme of "Change and Opportunity: Mobilizing Support Against Hunger," building on the goals and plans embodied in the Bellagio Declaration on Overcoming Hunger in the 1990s and the Medford Declaration to End Hunger in the U.S. For further information, please contact Jean Lawlor, Briefing Coordinator, Box 1831, Brown University, Providence, RI 02912; (401) 863-2700; FAX (401) 863-2192.

As a  
More  
ing e  
lated  
by th  
mode  
lated  
direc  
Supp  
perce  
their  
mode  
perce  
enha  
M  
provi  
other  
can  
beha  
our  
as nu  
effor  
also b  
Th  
achie  
active  
relate  
action  
sition  
Nutri  
gram  
tices.  
inform  
advoc  
frame  
food  
It is  
acqui  
throu  
sonal  
oped  
word