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Using a Theory-Driven Approach to Design a Professional Development Workshop

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ABSTRACT

The objective of this study was to show how a theory-driven approach to program planning was used to design and evaluate a professional development workshop. Our method was to demonstrate modeling of theory use as a teaching strategy. The Theory of Planned Behavior was used to structure all components of a 6-hour workshop. This workshop significantly increased participants' intention to use theory in designing programs ($P < .0001$). Educators can apply the methods demonstrated here to systematically use theory in the development, implementation, and evaluation of their workshops, staff trainings, and curricular materials for professionals and consumers.

KEY WORDS: theory, training, workshop

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BACKGROUND

Several comprehensive reviews of the effectiveness of nutrition education have concluded that nutrition education is more likely to be effective if it is based on clearly articulated theory.¹⁻⁴ Yet many published reports of nutrition education research and interventions do not systematically use behavior change theory. Theory has been defined as a set of inter-related concepts that present a systematic view of events by specifying relations among variables to explain and predict the events.⁵ Given that theory describes events and explains relationships by organizing principles and concepts,⁶ the-

ory-driven research⁷ has the potential to greatly improve the effectiveness of nutrition education.

In addition, it is widely accepted by researchers and practitioners that programs need to be research based. However, this requirement is often reserved for the nutrition science content when, in fact, it should also include using the research literature on how to change behaviors. Considerable research has been conducted by health psychologists and others to study how to change behaviors and, from this research, to build behavioral theories. When an educator ignores behavior change research in designing an intervention, it weakens the research base of the planned education—a shortfall comparable to ignoring content information on diet and cancer for a program on healthful eating.

At the request of members, leaders of the Food and Nutrition Extension Educators (FNEE) Division of the Society for Nutrition Education (SNE) planned a workshop, titled “Going Full Circle: Developing Theory and Model Driven Programs and Curricula,” as a 6-hour preconference professional development workshop for FNEE members at the SNE annual conference in 2001. Contento et al noted that educators' professional development was most effective when it addressed not only nutrition content but also the methods used in nutrition education,² and one strategy for teaching such methods is modeling. Therefore, instead of simply lecturing to workshop participants on theory use, FNEE board members (conference organizers) modeled the use of theory in the planning, implementation, and evaluation of this workshop. To dispel the myth that use of theory is reserved for researchers, this report demonstrates the feasibility of using theory to plan and evaluate a workshop—a workshop typical of what practitioners organize routinely. Specifically, our objective was to give an overview of how a theory-driven approach to program planning was used to inform the development and evaluation of a professional development workshop. Our method was to demonstrate

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modeling of theory use as our teaching strategy. The FNEE workshop is our example. Contento's procedures for designing nutrition education for dietary behavior change (unpublished, 2001) were used as the process, and the Theory of Planned Behavior (TPB) was selected as the theory.⁸

DESCRIPTION OF WORKSHOP (INTERVENTION)

The workshop was designed, implemented, and evaluated using a 6-step procedural model proposed by Contento (unpublished, 2001). These steps are described here.

Step 1: Assessment of Needs, Interests, and Assets of the Audience

Information was obtained from two sources. First, although the nutrition education research literature suggested that use of theory enhanced the effectiveness of nutrition education, theory is not used routinely by practitioners. Second, based on an assessment in 2000, FNEE members wished to learn more about theory use in programming.

Step 2: Selecting the Theoretical Framework

Several theories from the behavioral and health sciences have been used in designing nutrition education investigations and interventions.^{2,5,9} Conference organizers carefully reviewed these theories. Given the needs of the professional audience attending this workshop, the short time frame, and

the nature of the desired behavior change, conference organizers selected the TPB as the basis for the design, implementation, and evaluation of this theory-driven workshop.^{8,10} We opted to use the streamlined TPB model identified in the Figure instead of the more detailed version of the theory.

The TPB postulates that behavior is predicted by *intention* to perform the behavior (*behavioral intention*) that, in turn, is predicted by *attitudes*, *perceived behavioral control*, and *subjective norms* (see Figure). A desired behavior is predicted by a person's valuation of what she/he expects to be the outcome of the behavior.¹¹ For this study, the desired behavior was the use of theory by FNEE workshop participants to plan and evaluate educational programs (throughout this article, the term "programs" refers to programs, curricula, and/or interventions). *Behavioral intention* to use theory was determined by 3 constructs: *attitudes/motivations*—operationalized as anticipated outcomes of using theory (eg, increased program effectiveness, peer recognition, increased likelihood of manuscript acceptance by a journal) and the importance of those outcomes to the participant; *subjective norms*—what colleagues, mentors, and supervisors think about use of theory; and *perceived behavioral control*—the participant's perceived capability and confidence (self-efficacy) to use theory to plan programs. Self-efficacy has been viewed as a construct conceptually related to perceived behavior control.¹⁰ Self-efficacy is defined as a person's belief in his/her capabilities to achieve different levels of performance attainment.⁵ In addition, self-efficacy was identified as being influenced by each participant's perceived barriers, the strength of the partici-

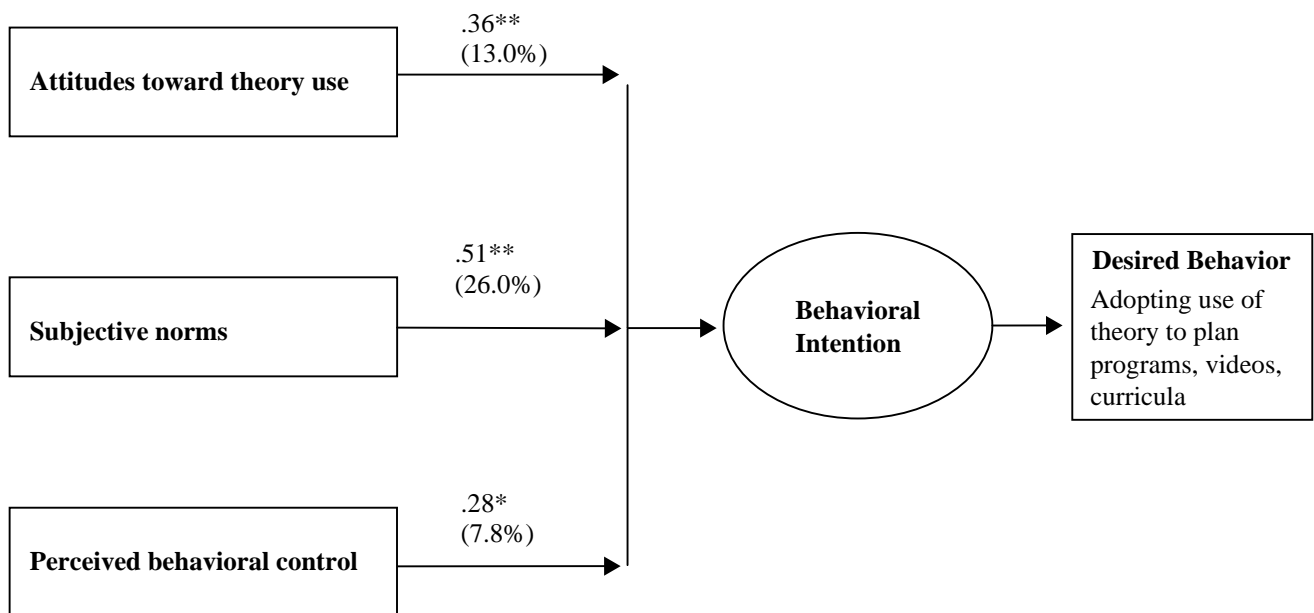


Figure. Theory of Planned Behavior schema. Zero-order correlations among changes in psychosocial variables using the Theory of Planned Behavior are shown. Percent of variance (r^2) accounted for by each variable independently in the outcome variable (behavioral intention) is reported in parentheses. * $P < .05$, ** $P < .01$.

participant's "how-to" knowledge about using theory, and the participant's skill level in using theory.

Given the workshop's short duration and the practical limitation that the desired behavior could not be directly observed later, the workshop focused on behavioral intention as the targeted outcome.

Step 3: Determining Theory-Based Goals and Objectives

The objectives were designed to address variables identified by TPB (see Figure) as targets for nutrition education intervention. Thus, the objectives were that participants would

- understand the outcomes of using theory to plan and evaluate programs and value those outcomes (attitude);
- feel more confident in their personal abilities to use theory to plan and evaluate programs (perceived behavioral control);
- understand expectations of influential "others" (eg, colleagues and journal editors) regarding use of theory to plan and evaluate programs (subjective norms); and
- intend to increase their use of theory to plan and evaluate programs (behavioral intention).

Step 4: Designing the Theory-Based Nutrition Education Intervention

The TPB was used to structure all components of the 6-hour workshop. The specific components are described below under Step 5.

Step 5: Implementing the Nutrition Education Intervention

Workshop presentations systematically addressed the constructs of TPB. The workshop opened with background information on TPB and a discussion of how this theory was used to guide the content of each presentation at the workshop. A multimedia presentation followed about the benefits of using theory to enhance participants' attitudes toward theory use and motivation to use theory.¹² Subjective norms were addressed by a research presentation showing how the use of theory by participants' peers doubled from the decade 1980-1989 to the decade 1990-2000—from 24% to 51% of research studies published in the *Journal of Nutrition Education*, now *Journal of Nutrition Education and Behavior (JNEB)*. In the next presentation, *JNEB* staff described how the use of theory was an increasingly important criterion for the selection of articles for publication in *JNEB*. This presentation was designed to reinforce subjective norms and enhance attitudes toward use of theory. To increase perceived behavioral control, skills training was conducted through the presentation of a practical and systematic 6-step process for designing, implementing, and evaluating theory-based nutrition education programs.¹³ Two more skill-enhancing segments reinforced perceived behavioral control by breaking the process into further steps and by sharing an example of

a systematic approach to designing research-based programs. A poster session featuring members' theory-driven programming gave participants an opportunity to share and discuss examples with Cooperative Extension (CE) colleagues.

The afternoon featured interactive discussions of theory-driven programming currently available: "EatFit"¹⁴ for adolescents using Social Cognitive Theory; "Dining with Diabetes"¹⁵ for adults using the Transtheoretical Model; "Partners in Wellness"¹⁶ for seniors using the Socio-ecological Model; and "Jump 'n Jive: Come Alive with Fruit"¹⁷ for low-income adults using the Transtheoretical Model and social marketing.

DESCRIPTION OF THE EVALUATION

Step 6: Evaluating the Nutrition Education Intervention Using Theory

The workshop was systematically evaluated by designing, administering, and analyzing an instrument that addressed the constructs of the TPB. The research protocol for evaluating the effects of this workshop was approved by the Human Subjects Review Committee at the University of California, Davis (Protocol #993361).

Instrument Development

A test/posttest survey was developed to assess the impact of the workshop on the TPB constructs via 3 items each for attitudes, subjective norm, perceived behavioral control, and behavioral intention. This instrument was developed by 3 nutrition education researchers and reviewed for appropriate content by 3 other researchers and one practitioner. Two additional practitioner-users reviewed the instrument for appropriate language for this audience. The instrument was revised accordingly and is shown in the Table. A 5-point Likert scale was used for responses. The posttest contained the same 12 items plus 2 yes/no items in which participants were asked if they stayed for the entire program and whether the workshop sparked new ideas. The standardized item Cronbach α coefficients for attitudes, subjective norms, perceived behavioral control, and behavioral intention subscales had acceptable internal consistency values (coefficients = .85, .61, .65, and .91, respectively) using a cutpoint of .60.^{18,19} A greater number of items in each subscale would probably increase the coefficient given that the α is sensitive to number of items in the subscale.¹⁸

Subjects

The majority of workshop participants worked in the Cooperative Extension Service of land grant universities. Of the 141 Extension educators who completed at least one of the surveys and received an ID number, 134 completed the pretest and 119 completed the posttest. To assist with matching pre- and posttests, respondents were asked to identify 2 markers: month and day of birth and the last 2 digits of their

Table. Change in Mean Scores from Pre- to Posttest by Item and Theoretical Construct

	Pretest Mean	± SD	Posttest Mean	± SD	P Value*
Attitude					
Cronbach $\alpha = .85$ (n = 93)	4.42	0.59	4.78	0.50	< .0001
Individual items					
1. Using theory will help me increase the effectiveness of my programs/curricula/interventions.	4.44	.63	4.76	0.58	< .0001
2. It is important to me to use theory to develop a program/curriculum/intervention.	4.42	.68	4.79	0.49	< .0001
3. It is important to me to use theory to plan evaluations.	4.40	.69	4.78	0.55	< .0001
Subjective Norm					
Cronbach $\alpha = 0.61$ (n = 84)	3.92	0.72	4.28	0.63	< .0001
Individual items					
4. Reviewers of the journals in my field (eg, <i>JNEB</i>) expect authors to use theory to plan a program/curriculum/intervention.	4.27	0.73	4.75	0.56	< .0001
5. My peers expect me to use theory to plan a program/curriculum/intervention.	3.81	0.99	4.25	0.83	< .0001
6. My boss/mentors expect me to use theory to plan a program/curriculum/intervention.	3.69	1.07	3.84	1.01	.116
Perceived Behavioral Control					
Cronbach $\alpha = 0.65$ (n = 91)	3.49	0.90	3.76	0.85	< .001
Individual items					
7. Theory use may be important, but I do not have the resources (time and money) to use theory.	3.29	1.33	3.19	1.35	.431
8. I feel confident I have the skills to use theory to develop and implement a curriculum/program/intervention.	3.70	1.00	4.03	0.93	< .001
9. I feel confident I have the skills to use theory to evaluate a curriculum/program/intervention.	3.61	1.06	4.06	0.93	< .0001
Intention					
Cronbach $\alpha = 0.91$ (n = 85)	4.31	0.73	4.57	0.60	< .0001
Individual items					
10. I intend to use theory to plan my next curriculum/program/intervention.	4.36	0.74	4.65	0.57	< .0001
11. I intend to use theory to guide the evaluation of my next curriculum/program/intervention.	4.29	0.74	4.64	0.57	< .0001
12. I intend to use theory to plan a curriculum/program/intervention within the next 6 months.	4.26	0.87	4.44	0.93	.039
Total scale, 12 items (n = 78)	4.06	0.51	4.36	0.50	< .0001
Posttest Only					
13. Did you stay for the entire program today? _____ Yes _____ No					
14. Did today's program spark any new ideas for you? _____ Yes _____ No					

*P values from paired t test, range of scores 1-5 (n = 93).

social security number. Ten pre- and 10 posttests were not identified with markers. With the exception of the 2 additional items on the posttest, analyses in this article were for 93 subjects with matched surveys and markers. Although we do not have the demographics of these specific 93 conference participants, we do know that of the FNEE membership, 95% were CE specialists based at land grant universities

and CE advisors based in county offices in states and US territories. Women composed 99% of the membership.

Results

The mean values for each item and each theoretical construct for pre- and posttests are shown in the Table. The theoretical

construct is represented by the mean of 3 items in each scale. Mean scores for all items increased significantly from baseline to follow-up, with the exception of 2 items: item 6, "My boss/mentors expect me to use theory to plan my program/curriculum/intervention" ($P = .12$), and item 7, "Theory use may be important, but I do not have the resources (time and money) to use theory" ($P = .43$). The paired t test results showed statistically significant gains for behavioral intention ($P < .0001$), the outcome variable, and for the 3 predictor variables postulated to contribute to intention (attitudes, $P < .0001$; subjective norms, $P < .0001$; perceived behavioral control, $P < .0001$). The scale means for the pre- and posttests constructs are shown in the Table. For a similar workshop in the future, planners could specifically address the issue of resources. For example, a speaker could share examples of the cost (time and money) of theory-driven programs compared with traditional programs (item 7). In addition, a CE director might present approaches for informing bosses/mentors about theory-driven programming (item 6).

Zero-order correlation coefficients and variance (r^2) in the change in behavioral intention accounted for by each predictor variable are displayed in the Figure. The Figure shows that all relationships exhibited reasonable correlations (.28-.51).

The analyses were repeated using partial correlation procedures for behavioral intention and a predictor variable (results not shown in Table or Figure). Controlling for the effects of regression to the mean, the correlations between gain in each predictor variable and gain in behavioral intention from pre- to posttest were attitudes, .50; subjective norms, .58; and perceived behavioral control, .38. The variable explaining the most variation in change in behavioral intention (33%) was subjective norm. Change in attitudes and change in perceived behavioral control accounted for 25% and 14%, respectively, of the variation in change in intention. Using linear regression, the variable that explained the most variation in change in behavioral intention controlling for all baseline values was subjective norms, which explained 20% of the variance in change in intention. Change in attitudes explained 16% and change in perceived behavioral control 10%. The results of the stepwise regression analysis revealed that 39% of the variance in change in intention was explained by the baseline values for the 3 predictor variables. With the addition of subjective norms to the model, the cumulative R^2 was .59. Adding attitudes and perceived behavioral control stepwise, the cumulative R^2 was .62 and .65, respectively. With addition of the 3 change variables, an additional 26% of the variance in the change in intention was explained. The 3 predictor variables in TPB accounted for a cumulative 65% of the gain in intention to use theory.

Of the 106 participants completing the 2 additional items on the posttest, 97 (92%) stated that the conference program sparked new ideas for them. Of the original 141 educators who completed at least one survey and received an ID number, 109 (75%) indicated that they remained for the entire workshop.

DISCUSSION

The purpose of this project was to demonstrate the feasibility of using theory to plan and evaluate a typical workshop that might be sponsored by FNEE member practitioners. Use of theory is often thought to be reserved for researchers and research projects. We wanted to increase understanding about theory for practitioners. One theory was modeled in all phases of the workshop, from planning to implementation and evaluation, whereas other theories were described via peer-educator use in programming. The results indicated that the desired outcome, nutrition educators' intention to use theory, changed in the direction of increased use of theory. Importantly, the evaluation results showed that 65% of the positive change in participants' behavioral intention was accounted for by changes in their attitudes, subjective norms, and perceived behavioral control.

The pretest scores were high, as may be expected with the level of experience and advanced education of the audience members. The workshop's content was not necessarily new information for participants because funding sources and professional journals have indicated a preference for funding and publishing theory-driven intervention research. A study by Glanz and Rudd found that regardless of funding and publishing preferences, a similar group of nutrition educators, also members of SNE, had pessimistic or neutral opinions about whether research in general and theory-driven research specifically were useful, practical, and timely for designing effective consumer nutrition education.²⁰

The TPB was selected for use in planning this workshop because it focused on personal psychosocial variables or perceptions that were thought to be potentially salient to the use of theory by nutrition educators. An environmental component was not possible given the setting. The results from the regression analyses indicate that TPB was well chosen as a guide for planning the workshop and would be a wise choice for planning future professional development workshops of this type.

Although participants' mean scores were fairly high with regard to their attitudes toward using theory, their scores were lower for subjective norms, particularly their beliefs about their bosses' and mentors' expectations for theory and model use (item 6; see Table), and lower still for perceived behavioral control, particularly the perception of a lack of resources (item 7; see Table). The workshop seems to have been particularly successful in increasing the salience of subjective norms overall with respect to theory use and in terms of peers in particular because the increase in this variable predicted 20% of the gain in behavioral intention in the linear regression analysis. An increase in the already positive attitude toward theory use also contributed to the increase in behavioral intention. However, the workshop did not, and indeed probably could not have, increased the perceptions of the participants that their bosses or mentors expected them to use theory. This item was probably more suitable for the pretest only because its sensitivity to change following the

workshop is nil. Future research might involve how to educate bosses and mentors so that their supervision and mentoring include the use of theory as an expectation.

In terms of perceived behavioral change, the workshop did not change participants' opinion about the resources (time and money) to use theory in planning and evaluating programs or interventions. This opinion seems to be based on the assumption that the systematic use of theory takes more time and money. But does it? If the outcome of effective programs is behavioral change, a question of interest is how use of behavior change theory might improve the outcomes of a program. Use of the TPB for planning the content of this workshop helped organizers focus on specific psychosocial/predictor variables theorized to be important to behavior change by professionals. Without theory to plan and evaluate the workshop, valuable time could have been unnecessarily diverted to presentations and activities less likely to promote change. Instead, organizers focused the content of the workshop on those constructs theorized to influence the adoption of the desired new behavior. In addition, use of theory made it easier to design an evaluation instrument for the workshop because instrument content could be specifically aimed at the constructs in the theory. Thus, in this instance, use of theory saved time and effort for conference organizers. Theories provide roadmaps for promoting behavior change. Consequently, educators need to know about the variety of theories available to them so that they select appropriate theory/theories for the type of behavior desired, the target audience, and the characteristics of the intervention. Indeed, as resources tighten, the importance of showing the impact of nutrition education on specific psychosocial factors or predictor variables that mediate the successful outcomes, in addition to impact on outcomes themselves, has become critical.

Limitations

The major limitation of this study was the lack of a control group. Consequently, several threats to internal validity must be evaluated.²¹ A testing effect was likely to exist and could be attributable to several reasons. First, participants may have responded to the pretest more favorably as a result of workshop objectives being publicized before the workshop. Also, the workshop attracted nutrition educators interested in learning about the use of behavioral theory in nutrition education programming. Given the purpose of the workshop, some participants may have been unwilling to report on the pretest, even on a blind survey, that they do not use theory. It also might be that some participants may have incorrectly believed and stated on the pretest that they did use theory in their programming. This would give them a false-positive on the pretest. Once they went through the workshop and better understood using theory in planning programs, they may have realized their error. To account for such an issue, we could have asked an additional question on the posttest that allowed them to correct their previous answer. The question

might be stated as, "Now that you have learned more about theory use in developing programming, would you say that you had ever used theory in program planning prior to this workshop?" If either of the above threats to validity influenced interpretation of results, the results would be in the direction of a diminished outcome. A "retrospective pre" format for the posttest survey may have been a successful alternative test format.²²

Second, the pretest itself may have promoted learning by sensitizing participants to the content of the workshop. Another threat, reactivity, may have occurred because the pretest may have served as a stimulus to change rather than a passive record of behavior.²³ Consequently, an alternative hypothesis must be considered: gains in scores observed from pre- to posttest were due entirely, or in part, to testing and/or reactive effects.

The gold standard for a research design for this workshop is a randomized controlled trial. However, our primary purpose was not to provide evidence for effectiveness of the workshop but to describe how theory was actively used in this process.

Another limitation is that we measured behavioral intention, not actual behavior, recognizing that the two are not synonymous. Although the latter was preferred, it was not feasible for us to monitor future behavior given that participant anonymity was a requirement of the Institutional Review Board's approval of our study protocol. However, in future similar workshops, each participant could be given a questionnaire with a stamped addressed envelope requesting that the post posttest be completed and mailed in 6 months. However, the rate of return could be quite low because many will forget or lose the materials in the interim. Another approach might be to take advantage of recognition of one's own handwriting as a tool to increase follow-up survey response. Begin by stuffing blank envelopes with a follow-up survey and a stamped self-addressed envelope. Give each participant one of these stuffed envelopes and ask them to check for the presence of both items, to seal it, and then to address the envelope to themselves. Collect these and mail them out in 6 months. They know what is inside and will more likely respond. Finally, we could have posted the survey on the Internet and publicized it on the SNE listserv. Others could do this, but a method of response would have to be devised to maintain participant anonymity.

IMPLICATIONS FOR RESEARCH AND PRACTICE

FNEE conference organizers used theory to plan, implement, and evaluate a workshop for professional educators in an effort to increase the workshop's effectiveness and to model the use of theory in planning and evaluating a program. This theory-driven workshop significantly increased participants' intention to use theory in designing programs. Specifically for this workshop, the TPB was extremely use-

ful in assisting conference organizers with the selection of the workshop content, design of the evaluation, and interpretation of the results. FNEE educators can apply the methods demonstrated here to systematically use theory in the development, implementation, and evaluation of their workshops, staff trainings, and curricular materials for professionals and consumers.

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REFERENCES

1. Johnson DW, Johnson RT. Nutrition education: a model for effectiveness, a synthesis of research. *J Nutr Educ*. 1985;17(suppl):S1-44.
2. Contento IR. The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: a review of research [Special Issue]. *J Nutr Educ*. 1995;27:277-422.
3. Lytle L, Achterberg C. Changing the diet of America's children: What works and why? *J Nutr Educ*. 1995;27:250-260.
4. National Cancer Institute. The efficacy of interventions to modify dietary behavior related to cancer risk. Volume 1. Evidence report and appendices, Vol 1; No 25, 2001. US Dept. of Health and Human Services. Publication 01-E029. Available at: <http://www.ahcpr.gov/clinic/dietsumm.htm>.
5. Glanz K, Rimer BK. *Theory at a Glance: A Guide for Health Promotion Practice*. Washington, DC: National Institutes of Health, National Cancer Institute; 1997. NIH Publication No. 97-3896.
6. Novak JD, Gowin DB. *Learning How to Learn*. New York: Cambridge University Press; 1984.
7. Smith JL, Lopez LM. The application of theory and its relationship to program effectiveness in nutrition education research. *J Nutr Educ*. 1991;23:59-64.
8. Montano DE, Kasprzyk D, Taplin SH. The Theory of Reasoned Action and the Theory of Planned Behavior. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education: Theory, Research and Practice*. 2nd ed. San Francisco, Calif: Jossey-Bass Publishers; 1997:85-112.
9. Baranowski T, Cullen K, Baranowski J. Psychosocial correlates of dietary intake: advancing dietary intervention. *Annu Rev Nutr*. 1999;19:17-40.
10. Godin G, Kok G. The Theory of Planned Behavior: a review of its applications to health-related behaviors. *Am J Health Promotion*. 1996;11:87-98.
11. Ajzen I. The Theory of Planned Behavior. *Organ Behav Human Decision Processes*. 1991;50:179-211.
12. Achterberg C. Theory in nutrition education, 20 year odyssey. Paper presented at: Food and Nutrition Extension Educators Pre-conference at Society for Nutrition Education Annual Meeting; July 20, 2001; Oakland, Calif.
13. Contento I. Designing and implementing theory-based nutrition interventions. Paper presented at: Food and Nutrition Extension Educators Pre-conference at Society for Nutrition Education Annual Meeting; July 20, 2001; Oakland, Calif.
14. Townsend M, Horowitz M, Shilts M. EatFit. Available at: <http://anr.catalog.ucdavis.edu>. Accessed February 20, 2003.
15. Brown G. Dining with diabetes. Available at: www.wvu.edu/~exten/infoces/pubs/nut_hlth.htm. Accessed February 20, 2003.
16. McClelland J. *Partners in Wellness*. Available at: <http://www.ces.ncsu.edu/Wellness>. Accessed September 10, 2003.
17. Wisconsin Nutrition Education Network. "Jump 'n Jive: Come Alive with Fruit" campaign. Available at: <http://www.nutrisci.wisc.edu/nutrinet/JJ%20home.htm>. Accessed February 20, 2003.
18. Contento IR, Randell JS, Basch CE. Review and analysis of evaluation measures used in nutrition education intervention research. *J Nutr Educ Behav*. 2002;34:20-25.
19. Pedhazur EJ, Schmelkin LP. *Measurement, Design, and Analysis: An Integrated Approach*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1991.
20. Glanz K, Rudd J. Views of theory, research, and practice: a survey of nutrition education and consumer behavior professionals. *J Nutr Educ*. 1993;25:269-273.
21. Cook TD, Campbell DT. *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Boston: Houghton Mifflin Co.; 1979.
22. Rockwell SK, Kohn H. Post- then pre-evaluation. *J Extension* [serial online]. 1989;27:19-21. Available at: <file:///C:/%23My%20Documents/Retrospective%20evaluation/pre%20then%20post.htm>. Accessed July 8, 2003.
23. Campbell DT, Stanley JC. *Experimental and Quasi-Experimental Designs for Research*. Chicago, Ill: Rand McNally College Publishing; 1963.