

The Evolution of Community Nutrition in the U.S.

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ABSTRACT

Drawing from journal articles, community nutrition textbooks, government documents, national conference reports, the author's own work in community programming, and discussions with practicing Community Nutritionists, this article illuminates the scope and character of community nutrition in the United States. It traces the roots of community nutrition in home economics, nutrition, education, communication, social and behavioral sciences, and describes the evolution of theory. And finally it suggests issues to be addressed by community nutrition researchers and practitioners through collaborations that integrate perspectives within community nutrition and strategically cross disciplinary boundaries. These include : 1) theory development and application in research and practice within philosophically consistent perspectives ; 2) methodological development(qualitative and quantitative) drawing from the social and behavioral sciences that apply to community nutrition ; 3) taking a long view of community nutrition and recognizing that change requires integrated efforts over long periods of time ; 4) engaging community stakeholders in research as well as program planning and 5) engaging with community nutritionists from other countries for cross-cultural research and conceptualization. This journal and the Korean Society for Community Nutrition, as the only journal and society expressly devoted to community nutrition, would be the best context for such collaborations. (*J Community Nutrition* 5(4) : 195~208, 2003)

KEY WORDS : community nutrition · theory · methodological development.

Introduction

The purpose of this article is to illuminate the scope and character of community nutrition in the United States through reviewing how it evolved in distinct contexts, and to offer some thoughts for the future of Community Nutrition. To demonstrate the evolving nature of Community Nutrition, this paper draws from journal articles, community nutrition textbooks, government documents, national conference reports, the author's own work in community programming, and discussions with practicing Community Nutritionists.

1. Community nutrition meanings in different contexts

The evolutionary and multi-faceted nature of community nutrition is illustrated by the depictions of community nutrition found in textbooks, curricula statements, and graduate

program descriptions. Community nutrition in its broadest sense could be defined as nutrition in a community. In 1977 the *Journal of Nutrition Education* published Guidelines for Academic Preparation of Community Nutritionists (Guthrie et al. 1977) which stated, Because academic programs in community nutrition must be responsive to the changing needs of society, it is essential that the viewpoint of administrators, community nutritionists and consumers be considered and reflected through an on-going program of curriculum revision and evaluation. However, nutrition in communities takes on many forms and is carried out in overlapping contexts. These contexts include families ; community food, health and educational systems ; local governments ; and religious, philanthropic, volunteer and other organizations. Local, state and national organizations, government agencies, and policy makers and, in some cases, private organizations provide both resources for and constrain community nutrition efforts. These also have dimensions of time and space in communities as well as broader external.

Community nutrition is rooted in the social and behavioral sciences as well as biological sciences. In accord with this, it has been defined differently in different contexts. The Cornell

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Community Nutrition Program graduate brochure defines Community Nutrition as being "concerned with promoting health and preventing disease. Community nutritionists work in community institutions considering problems ranging from hunger to obesity and deal with social and political units that range from families to governments."¹ The Encyclopedia of Nutrition (Sadler 1999), cites several definitions, but suggests that none captures the breadth and depth of the topics and activities of Community Nutrition researchers and practitioners (Guthrie et al. 1977). described a community nutritionist as "a person with scientific knowledge of the principles of nutrition, who disseminates nutrition information or is concerned with the nutritional health implications of policies or decisions relating to food production, marketing and utilization, and consumption.

Obert (1986) described community nutrition as "the field in which the subject matter of nutrition and related science is used by nutritionists to help individuals, families, and communities solve their nutrition problems. She includes public health within community nutrition as" that component conducted by an official government agency. "Obert also included treatment of nutrition problems" as a concern of community nutritionists. She distinguished community nutrition by "the process of interaction between nutrition personnel and community for the solution of nutrition problems." Owen and Frankle (1986), regarded community nutrition as an "essential component of health and health care" They described public health nutritionists and community dietitians as those who manage and "provide direct nutrition care and nutrition education to patients or clients and to the public." More recently, also, drawing from the perspective of the American Dietetics Association, Community Nutrition is the branch of nutrition that addresses the entire range of food and nutrition issues related to individuals, families, and special needs groups living in a defined geographical area. Community nutrition programs provide increased access to food resources, food and nutrition education, and health care

¹Although not necessarily agreed upon by all community nutritionists at Cornell, the strategic planning report statement about community nutrition includes food and community systems states that the "program promotes the health and well-being of citizens through improved nutrition and food choices supported by functional and sustainable community systems addressing the health, education and food needs of citizens." The Cornell-based Family and Community Food Decision-making Program vision includes food as well, "Healthy families served by resilient community food systems."

(Endres 1999).²

Community Nutrition might aptly be described as comprised of a kaleidoscope of theories, methodologies, and practices drawing from the social behavioral and biophysical sciences. Drawing from just a few of the above descriptions, it is apparent that community nutrition has no single agreed-upon meaning, rather it has many meanings.³ The concepts : nutrition, health promotion, disease prevention, and, even treatment were found in one or more of the definitions above. In some of these descriptions, community nutrition is a component of nutrition or health (health care) and others. Some descriptions reflect an orientation toward solving problems and avoiding diseases, while others emphasize promoting health. All contain reference to "community" in some form and some also refer to individuals and families. According to these definitions, community nutritionists disseminate information and, in the process, address, work in, help, interact with, provide, and manage. Most descriptions limit the scope to "health," with (Guthrie et al. 1977) being an exception.

These varied concepts and meanings, like yarn, can be woven together metaphorically to form the "fabric" of community nutrition. This fabric incorporates yarn of many sizes, shapes, and colors and they are connected in unique ways. In practice, unfinished pieces - each with its own individual characteristics - are often applied in research or in a community or with particular families or individuals. In practice, the "fabric" of community nutrition is more serviceable when local knowledge "yarns" are woven in to fill the gaps and expand the coverage. These fabrics or theories more nearly reflect "reality" when they are tested in practice and revised accordingly. A well-crafted piece includes the right balance of inputs for addressing the particular problem and/or developing the potential of those engaged in the weaving process as well as those using the "fabric." More than one piece of fabric may serve a particular end, but the elusive goal of weavers is always to achieve a good fit between fabric and wearer's needs.

To fill some gaps in the more academic definitions of community nutrition, this paper draws from the knowledge of practicing community nutritionists as well. Attendees at a

²According to Endres, the profession of community nutrition is rooted in dietetics and public health.

³For this apparent reason, the authors of the Community Nutrition section of the Encyclopedia of Human Nutrition (1999) were unable to offer a coherent definition of community nutrition.

workshop on “Rethinking Community Nutrition : Integrating Theories and Perspectives⁴ described their work in terms not only of “community nutrition,” but also of “(food) and nutrition education, community nutrition, social change,” “development of nutrition education programs,” “public health nutrition focused on community,” “education of community nutritionists,” “nutrition consulting,” “nutrition counseling,” “nutritional anthropology,” and “community nutrition education.”

When asked, “How would you define ‘community nutrition’?” and “How do you describe it to those outside the field?” community nutritionists working in a variety of settings, provided insights on the common threads and rich diversity of their work, such that it makes a colorful “fabric.” Selected responses offer further insights into the description of community nutrition. Darlene Lansing⁵ defines her philosophical approach to community nutrition by four E’s : educate, enable, engineer, and enact. She views a community (and teaches graduate students to view a community) as “a system and applying each strategy to the macro as well as micro level insofar as possible.” She describes nutrition education as “a major strategy within the larger intervention framework,” one which she notes “fosters informed choice.”

Leigh Gantner⁶ states that “community nutrition involves both research and practice.” She notes that community nutrition research investigates questions “about food and its relationship to people and their environment.” From her perspective, “research is then integrated into programs, policies, education, and other outreach efforts, to influence, educate, and change behaviors to create healthier individuals and communities.”

⁴Susie Craig, Ardyth Gillespie, and Kim Raine, *Rethinking Community Nutrition: Integrating Theories and Perspectives*. Workshop at the Society for Nutrition Education annual meeting in Oakland California, July 2001.

⁵Darlene Lansing has held positions as community nutritionist with the Minnesota Heart Health Program, public health, Women’s Infant and Children’s program, executive director of the Society for Nutrition Education and taught graduate community nutrition courses at the University of Minnesota and now owns her own consulting business with her husband, George, Lansing squared.

⁶Leigh Gantner brought perspectives of biology and anthropology (from her B.S. degree at Binghamton University) and experience working in a biotechnology research laboratory to her graduate work in Community Nutrition at Cornell. Since she completed her M.S. degree she has been working in Cayuga County to develop a new nutrition education program for Cornell Cooperative Extension supported by the Food Stamp Nutrition Education Program. She has also successfully sought support for interests in Expanded Food and Nutrition Program.

“Community nutrition is providing nutrition services in the context of people’s daily lives, where they live and work and play,” as described by Barbara Mayfield.⁷ “We might work with people as individuals or within groups, including family, educational or work groups, social groups, religious groups, sport/recreational groups, service organizations, etc. Services are broad and can include providing food, as in food pantries and WIC and food stamps, providing screening and assessments, education and counseling, prevention and treatment programs, etc.”

Gantner and Mayfield each describe the relationship of nutrition education to community nutrition as two overlapping circles. Lansing sees education as “just one tool in the toolkit of the community nutritionist/change agent...” On the other hand, Laura Winter-Faulk⁸ describes the relationship as a direct and indirect one. “Nutrition education can have a direct relationship to community nutrition when it involves direct nutrition education to the community. However, the relationship becomes much more indirect when researchers explore new findings in psycho-social aspects of nutrition, such as nutrition behavior, which need to be interpreted and extrapolated into links to practice before they can benefit the community. In this case, the researchers are the ‘nutrition educators’, and the ‘nutrition professional’ is the ‘community’ that they are serving.” Each of these depictions from practicing community nutritionists adds to our comprehension of the complex and variegated “fabric” of community nutrition.

2. Framework for analyzing community nutrition research : basic and intervention

Table 1 shows another way of conceptualizing the scope of community nutrition, that is, by categorizing the foci of studies and intervention programs and their intended purpose.⁹ Theory and methodological development continue to be important in furthering the field. The analytically sepa-

⁷Barbara J. Mayfield, MS, RD, has more than 20 years experience working with children and families as an early-intervention nutrition specialist, nutrition educator, and consultant/writer. She has extensive experience as a presenter, as well as being a university instructor teaching a course in nutrition education/communications.

⁸Laura Winter Faulk divides her time at Cornell University as both a researcher on Dietary Change and as a member of the Cornell Nutrition Works team, an internet-based continuing education program for nutrition professionals.

⁹The purpose is influenced by one’s perspective on free will and behavior change and the social construction of knowledge.

Table 1. A framework for analyzing community nutrition research and practice

RESEARCH FOCUS/PURPOSE ¹¹	F&N cognitive, affective and behavior intentions ¹²	F&N Behaviors/Practices	Influences on F&N Attitudes and Behaviors/ Practices	F&N Decision-making Contexts: families, communities, educational programs, research perspective ¹³
Consumer or decision-maker	Bisogni et al. 2002	Matheson et al. 1991	Contento, Murphy 1990 ; Kirk, Gillespie 1990 ; Brun 1981	
Community nutritionists	Contento et al. 1996	Contento et al. 1996	Bisogni 2003	Gillespie et al. 2003 ; Gillespie 1998
Food systems practices	Wilkins et al. 2001			Travers 1997 ; Pelletier et al. 1999
Theory ¹⁴ Development	Axleson, Brinberg 1992	Johnson, Johnson 1985 ; Beffa-Negrini, Cohen, 1990	Achterberg et al. 1985	Gillespie, Yarbrough, 1984
Methodology	Axleson, Brinberg 1992	Keenan et al. 2001	Achterberg 1988 ; Brun 1980 ; Lewin 1943	Gillespie, Gillespie 2003

able constructs of knowledge, attitudes, and behaviors have been used widely in community nutrition research and evaluation. In this table, behavior intentions (Fishbein 1975)¹⁰ are included as well. Behaviors and practices related to food and eating have been a major part of community nutrition and, because they begin with different perspectives, different analysts construe these frameworks and methodologies differently. Behaviors include dietary, food choice, food habits, and food consumption. Many studies have been designed to identify influences on food and nutrition attitudes, behaviors and practices, including intentional behavior change interventions (nutrition education). Studies may also be designed to consider the multiple contexts in which these influences occur including families, communities, schools and research perspectives. Selected studies and/or program reports were chosen to illustrate the type as examples of each cell in this table. While these are only a few examples, this framework could organize a much more exhaustive review and critique of community nutrition.

The next section takes a historical perspective on the evolution of community nutrition including some of the roots of

the multiple perspectives on it.

3. Diverse beginnings for community nutrition : rooted in biological and social sciences

As illustrated in the previous section, community nutrition is conceptualized in varied ways, depending on context. Contexts are located in particular times and spaces, and focuses on difference segments of population contexts and conceptualizations from other fields have shaped the meanings and methodologies of community nutrition.

Where, when, and by whose efforts did community nutrition begin to emerge as a field of its own? These are simple questions, but have complex answers. Anthropologists have long been interested in food habits as part of the cultures they studied. Similarly, sociology and other social sciences have long traditions of the study of food and foodways. Home economists and nutritionists were early proponents of improving the health of people in communities through improving food and nutrition. Much of the research and intervention has been supported by the Land Grant Universities and the United States Department of Agriculture (USDA). Although research about *why people eat what they do and why and how they change* is ubiquitous, a discussion of these four fields of study provides a rich description of the fabric of community nutrition. Themes of the USDA and land-grant-university system are woven throughout.

1) Social and behavioral science roots

Although the USDA and the land-grant system have been

¹⁰Fishbein and Ajzen's model, behavioral intent is not part of attitude, but a separate outcome (Gillespie 1987).

¹¹The references cited in this table are largely drawn from review articles in nutrition education research and articles to give examples to test the conceptualization and help describe it to readers. Empty cells should not be interpreted to mean there are no studies. One study may fit into more than one cell.

¹²There are different ways to conceptualize knowledge, attitudes, and behavior. For purposes of community nutrition, Gillespie and Yarbrough have conceptualized these constructs drawing from social psychology (Fishbein, Ajzen 1975) as cognitive (information or knowledge), affective (feeling/like-dislike), behavioral intention, and behavior. Also see Sims, 1981 for discussion of attitude measurement and conceptualization in community nutrition.

¹³This purpose moves research and intervention from individual behavior change to changes in systems that constrain individual change. Very little research in Community Nutrition takes this critical perspective

¹⁴Although models are not theories, but applications of theory, both are included in this category for simplicity.

the primary homes of nutrition and its community nutrition components, other fields--offering different perspectives on food and nutrition in communities--were laying the groundwork for contributions to community nutrition as well. During World War II, the anthropologist Margaret Mead served as Executive Secretary of the Committee on Food Habits of the National Research Council (National Research Council 1943, p.3). The committee was formed as a "nutrition program in relation to national defense activities." In her article on Dietary Patterns and Food Habit, Mead (1943) wrote, "As problems of nutrition take an increasingly important place in the foreground of our attention, we find that the same process is going on in nutrition and dietetics as in every other focal point of our social life--an attempt to cross-fertilize the thinking of the different specialized disciplines by a systematic interchange of techniques and insights." In a presentation to the American Dietetics Association, Mead described contributions which she thought anthropologists, sociologists, and social psychologists could make to understanding the cultural context for food habits research: "1) provide cultural self-consciousness to place any set of activities within our society against the backdrop of a systematic knowledge of many other cultures; 2) Give knowledge of the cultural dynamics which underlie our present acceptance or rejection of certain dietary practices--as a people."

Also turning his research to food habits during World War II, social-psychologist Kurt Lewin contributed an extensive article titled "Forces Behind Food Habits and Methods of Change" for the Committee on Food Habits (Lewin 1943). He concluded that for changing food behavior under the particular circumstances of his experiments, a group-decision method was superior to the request method, to the lecture method, and to the one-to-one method.

Building on the ecological framework used in anthropology research, anthropologists interested in food and nutrition organized symposia on nutritional anthropology in the mid 1970s (Jerome et al. 1980). These symposia served to "cross-fertilize" disciplines as advocated by Mead (1943). They also marked the formation of nutritional anthropology within the American Anthropological Association, a specialty which took a biocultural perspective that combined biological and cultural perspectives on the study of food and foodways. Pelto (1981) examined the anthropological approaches to the "study of factors affecting dietary behavior and program evaluation." She wrote, "Over the past several decades, the

productive collaboration of nutritionists and anthropologists has led to new avenues of research, reflected particularly in the emergence of an ecological approach to the study of food use and nutrition issues in human communities."

In his review of contributions from social-psychology, Hochbaum (1981) concluded that "nutrition education, no matter how effective, will have little impact by itself. Any profound, population-wide, and lasting changes in the food culture of the public will come only over a protracted period of time and only if all of these approaches are coordinated in a general and comprehensive strategy." He also argued for the need for more research, with all the complexity that implied, in the context of peoples daily lives. Coates (1981) posited that psychology has offered "models for explaining food choice" and strategies for intervention - particularly for treating obesity. He cited social learning theory, personal influence skills, and "practical influence skills" as strategies for community nutrition behavior change also in the context of psychology. Lyman (1989) wrote about the psychological meanings and significance of food, food preferences and emotions, and sensory stimuli in food from a psychological perspective on food preferences and choices.

2) Home economics and nutrition roots

Nutrition has been part of Home Economics since its beginning in the late 1800s (Stage, Vincenti 1997). Beginning as "domestic science" that included the selection and preparation of food, it was imbedded in the original concept of the land-grant university. The purpose and nature of home economics, including nutrition, was summarized in 1902 as:

The demand for home economics which will be met in time is a different kind. It is the demand which shows that home economics must always be regarded in light of its relation to the general social system, that men and women are alike concerned in understanding the processes, activities, obligations and opportunities which make the home and family effective parts of the social fabric (Tate 1961).¹⁵

During these early years, the land-grant component of home economics resided within colleges of agriculture and pioneers in the study of nutrition were located in the United States Department of Agriculture (USDA). One such pioneer, Wilbur O. Atwater contributed to the Lake Placid Meeting in 1901, through which home economics was defined as a field.

¹⁵As cited in Stage, 1997 from the Fourth Annual Lake Placid Conference.

USDA nutritionists cooperated with home economists in advancing the field by publishing their research, hiring graduates and “testifying to the scientific respectability of their work” (Stage, Vincenti 1997). USDA has continued to be the government agency most involved in community nutrition research and practice through Cooperative Extension, food assistance programs, and agriculture commodity programs, a stance derived from the view that “The essence of the agricultural enterprise is providing food, the right food to sustain people’s life and their health” (USDA). In the preface to one of several devoted to food, nutrition, and health, Secretary of Agriculture, Espy (1993) noted that he was “deeply concerned that all Americans have the right food to eat, but I also want people to have enough information to know what to eat.” Because of the philosophical and conceptual orientation of home economics, much of the early influences were on the community aspects of nutrition, including nutrition education. As the field of home economics expanded and become more scientific, it came to offer conceptual frameworks, theories, and applications pertinent to community nutrition (Deacon, Firebaugh 1988). Conceptual articles now appear regularly in the *Journal of Family and Consumer Sciences* (formerly *Home Economics*) (Gillespie 2002).

In the 1940s, articles about influences of food habits were being published by nutritionists (Eppright 1947) concerned about the application of nutrition in communities. Lowenberg et al.¹⁶ (1968) noted that advancements in nutrition research depended upon developments in the methods of chemistry, biological sciences, and clinical medicine as necessary precursors to nutrition as a science. Therefore, nutrition has been described as a twentieth century science. Also it wasn’t until the 20th century that “man’s concern for his fellow men, rather than just science emerged.”

“The history of nutrition is the story of people with questioning minds at work on the problems that affected the lives and health of all people. This is an exciting story interwoven with threads from medicine, anatomy, physiology, chemistry, bacteriology, and agriculture” (Lowenberg et al. 1968). And community nutrition is also an exciting story which is interwoven with threads of nutrition and home economics in the land-grant tradition, the social and behavioral science and, at times, also medicine.

In the 1970s, visionaries began to recognize that applying

¹⁶At the time this book was written, these authors were working in the context of a medical school in which home economics and nutrition were combined.

the emerging knowledge about nutrition and health in communities required much more than the transfer of knowledge from nutrition laboratories. Mostly trained in the biophysical sciences and experimental research methodology themselves, these nutritional scientists began to look outside their field for methodologies and, later, theories. In part, they turned to the social and behavioral sciences to help understand *why people eat what they do* and to develop methods to improve people’s diets.

In U.S. land-grant universities, nutrition has typically resided in Colleges of Home Economics and/or Agriculture.¹⁷ It was within this context that the need for nutrition education—a core component of community nutrition—was realized. By collaborating with nutritionists Home Economics educators helped to define community nutrition in general and nutrition education in particular (Eppright et al. 1957; Lowenberg et al. 1968). Indeed, food and nutrition has been part of the Home Economics movement since its beginnings in the late 19th century (Stage, Vincenti 1997). Home Economics quickly evolved within early land-grant universities, starting with applying domestic science in households and moving toward preparing professionals for roles in society. Among the nutritionists who pioneered nutrition education were Ercel Eppright from Iowa State University and Ruth Leverton from the University of Nebraska and USDA (Eppright¹⁸ et al. 1963)¹⁹ described the rationale for nutrition education as follows.

¹⁷Nutrition education was also beginning in other universities, such as Columbia University in the teachers college, Colleges of Home Economics around the country, and at Berkeley where the Society for Nutrition Education was founded (Ulrich 1992).

¹⁸The authors of *Teaching Nutrition* (1963) were one such team. Ercel Eppright held a Ph.D. degree in physiological chemistry. In 1961 she received the Bordon Award (which still continues...) “For her research contributions in nutrition... with special mention of her insight and enthusiasm in transforming research findings into practical daily application.” She was Head of the Food and Nutrition Department and later Assistant Dean, College of Home Economics, and Assistant Director of the Agricultural and Home Economics Experiment Station, Iowa State University. Mattie Pattison, Ph.D. education from the University of Chicago was Professor of Home Economics Education, Iowa State University. Her work included helping the U.S. Office of Education to “to clarify concepts and generalizations for home economics in secondary schools” to the educational component of the book. Helen Barbour had a Ph.D. in both nutrition and home economics education from Iowa State University. At the time *Teaching Nutrition* was published, Dr. Barbour was Assistant Dean Coordinating Home Economics Research, and Head of the Department of Food, Nutrition, and Institution Administration, Oklahoma State University.

¹⁹This is the second edition. The first was published in 1957.

“Basic to success in teaching people to change their food habits is an understanding of *why* they eat as they do... In our interdependent society, the maintenance of good nutrition depends on numerous environmental forces. Nutrition education, therefore, has a responsibility in helping people to understand these forces and to recognize the social action required to safeguard the food supply.”

They noted that nutrition affects health “within the framework of factors too infrequently recognized as potent influences in the state of nutrition-individual differences, environmental situations, group relationships, and quality of the food supply in a technological age.” These authors drew not only from nutrition, but also from home economics education. As the context in which nutrition education was first articulated, the contributions of home economics in general and home economics education in particular have been largely undervalued.

In another classic book which acknowledged this broader role of nutrition (Leverton 1960), describes her pioneering book, *Food Becomes YOU* as “...a kind of hybrid. Its information comes from research. Its philosophy comes from the evidence and knowledge that food is a strong force in every person’s life. Its style is the result of years of experience in explaining food and nutrition facts to mothers, fathers, youngsters, oldsters, and inbetweeners, collectively and individually.” As (Lowenberg et al. 1968) noted “Nutrition affects man’s health, ability to work, behavior, and learning ability. But knowledge is not enough ; man’s use of knowledge is not always guided by his reasoning ability. Many other factors influence how and to what extent man uses his nutrition knowledge and what he practices in food selection for himself and his family.”

The publication of *Nutrition, Behavior, and Change* (Giffit et al. 1972), formalized the concept of behavior change, at the individual level, as a legitimate component of nutrition education. These authors suggested that food habits are influenced by two categories of factors: the availability of foods and acceptability of the foods.

“Knowledge of the nutritional needs of man far exceeds understanding of how to make adequate use of this knowledge to improve man’s well-being. The purpose of this book is to enlarge the reader’s comprehension of the reasons for the gap between nutritional science and its effective application, and to offer guidance in shaping the types of efforts which might narrow the gap” (Giffit et al. 1972, preface p.

xiii).

Based on an early review of the literature in nutrition education and community nutrition, lack of knowledge and motivation were suggested as the reasons for sub-optimal food choices (Gillespie 1975). As her own understandings of community nutrition evolved, she labeled her earlier focus on individual behavior change as an “individual blame bias” (Gillespie 1989).

The biophysical science orientation of most nutrition departments shaped the field of community nutrition and constrained creativity in the application of social science methodologies and perspectives, a condition which limited the development of the field. In spite of these constraints (which still influence community nutrition), by 1980, the pace of introduction of outside ideas and new innovations into community nutrition and nutrition education increased rapidly. “To appreciate the rapid growth of community nutrition as an accepted area of nutrition specialization, we need only mark the establishment of new professional roles, the redefinition of many older roles, the emergence of a greatly expanded community consciousness among nutritionists everywhere” (Wright, Sims 1981, preface).

4. The emergence of community nutrition as a field of study and practice : a decade of ferment

During the 1980’s, the field of community nutrition emerged in the U.S. as a field of practice in its own right and research related to community nutrition increased dramatically. This section traces the development of community nutrition and connections to related fields through the rest of the 20th century.

In their curriculum recommendations for community nutrition for a Bachelor’s degree in nutrition and/or foods (Guthrie et al. 1977), included knowledge of “related physiological, biological, and behavioral sciences with an introduction to community and family organization and services, health delivery systems, human development, educational theory and methodology, statistics and computer science.”

Wright, Sims (1981), in one of the first books to use the term “community nutrition” in its title, drew from community health and health planning to describe the field as nutrition plus social sciences. They focused on population groups “sharing common health problems,” assisting people in communities, and program planning and implementation. One chapter described “Community Health, an Ecological Approach” as

one perspective on community nutrition action. Other chapters were on prevention and health promotion, and self-care. Diva Sanjur's book (1982), *Social and Cultural Perspectives in Nutrition* furthered the application of conceptual frameworks and methodologies from the social sciences to nutrition research. Dr. Sanjur pioneered in bringing the public health and international perspectives to community nutrition. Much of her work applied these frameworks in developing countries with the explicit goal of solving problems of malnutrition.

During this period of growth for community nutrition, related fields were developing which applied the social and behavioral sciences as well. Perhaps the most closely related were "nutrition education" drawing from the field of education, and "nutrition communication" drawing from the field of communication. In addition, community nutritionists were emerging with backgrounds in public health and other health sciences.

1) Nutrition education

Although from some perspectives education implies a limited focus of community nutrition, the activities of the Society for Nutrition Education suggested a broad scope that included much of community nutrition. The Journal of Nutrition Education has published articles in most of the cells illustrated in Table 1 and thus was well beyond a simple focus on nutrition education programs. A review of recent articles in the journal documents that topics beyond educational programs have included awareness, status, perceptions, dietary and food assessment, eating and behavioral patterns.²⁰

In the 1980's, nutrition education matured from a little recognized sub-field of nutrition, as described by Helen Guthrie in 1982, to a vibrant multi-disciplinary field drawing upon theoretical frameworks and methodologies from many fields. Between 1978 and 1981 four national conferences on nutrition education brought together leaders in the field for discussions. In 1978, the first of three conferences on nutrition education, sponsored by the National Dairy Council under the leadership of Judy Brun, was convened. Three more conferences followed in 1980 and 1981 : The Cornell Workshop on Nutrition Education Research : Applying Principles from the Behavioral Sciences (Olson, Gillespie 1981), funded through the U.S. National Science Foundation (NSF) ; a series of USDA sponsored workshops to identify

priorities in research held at Pennsylvania State University under the leadership of Louise Light (USDA) and Laura Sims (Penn State) ; and in 1981 the second NDC conference, titled "Nutrition Education Research Conference : Strategies for Theory Building" (Brun 1983)²¹. These conferences were instrumental in expanding the horizons of practitioners of community nutrition as well as those of nutrition education.

As noted previously, nutrition education is a major component of community nutrition. There have been several reviews, including three comprehensive reviews covering time periods from 1900 to 1995 (Achterberg, Clark 1992 ; Contento et al. 1995 ; Glanz et al. 1990 ; Johnson, Johnson 1985 ; Levy 1980 ; McKenzie, Mumford, 1965 ; Whitehead 1973). The following trends for nutrition education were drawn from these reviews and the references cited in the previous sections. Nutrition education is defined as "planned change programs" for the purposes of this section. Most nutrition education studies evaluate the effects of a program on knowledge, attitudes, and/or behaviors. During the 1970s and into the 1980s most nutrition education program evaluations used the knowledgeattitude-behavior model, but the measurement of changes in nutrition knowledge dominated (Gillespie 1981) and improving nutrition knowledge was often the program goal. Sometimes attitudes were measured, but behavior changes were difficult to measure (Gillespie 1981). This area of study is an example of the overlap of education and communication theory, which is discussed in the next section.

A third National Dairy Council sponsored conference, "The Leading Edge in Nutrition Education: Research Enhancing Practice" the synthesis of ideas from this conference included a list of these themes (Brun 1987) : networking, behavior change, nutrition education curriculum, forecasting. The researchable areas identified were : behavior change, organizational studies and community level studies.

In a review of the effectiveness of nutrition education (Contento et al. 1995), addressed educational strategies, behavioral change strategies, and environmental interventions, and community "activation and organization." They noted that nutrition education needs to be "ongoing and multifaceted" and that change takes time. A workshop on "Rethinking Community Nutrition" brought together a group at the Society for Nutrition Education 2001 annual meeting to reflect upon

²⁰Thanks to Samerah Ghorbani for assistance in reviewing articles in the Journal of Nutrition Education for 2002-2003.

²¹Planning Committee : Judy Brun, Ardyth Gillespie, Louise Light, Laura Sims, Harriet Talmage.

community nutrition.²²

2) Communication

In the late 1970s theories from the field of communication were introduced and offered a perspective to community nutrition which complemented that of home economics education. The unique aspect of communication theory, an application of social and behavioral sciences and engineering theories, is the importance placed on gaining the attention of audiences. Yarbrough (1981) observed that "Communication effects research has been guided by a diverse set of conceptualizations about the factors which cause differential communication response" which draw upon both sociology (Lazarsfeld 1949) and psychology (Hovland et al. 1959). He concluded that for nutrition education in communities, the "communication effects" perspective probably is more applicable to evaluating the short term effects of short-term education efforts. The social relations perspective, which he also reviewed, could have application to longer-term effects. The third perspective that Yarbrough reviewed, the pragmatic perspective (Watzlawick et al. 1967) reminds us that communication is an ongoing, dynamic process" and that context is the major influence on responses to nutrition messages.

The contributions of communication theories overlap a great deal with education, but the unique component of communication is that of gaining audience attention, something which is often assumed in studies of educational programs (Gillespie 1981). A nutrition communication model (Gillespie, Yarbrough 1984) for community nutrition research and programming includes the attention component (awareness and differential exposure) as well as an interaction component (between audience and communicator and between audience members and their peers) which along with comprehension (transformation of sensory stimuli into meaning) constitute the "intervening process" between inputs (audience predispositions and communicator decisions) and outcomes. According to the communication-based conceptual framework, the outcomes may be acceptance or rejection at the four different levels in Table 1, columns 2 and 3 : cognitive, affective, behavioral intention or behavior.

3) Health sciences

At the same time that community nutrition was developing

²²Susie Craig, Ardyth Gillespie, and Kim Raine. Rethinking Community Nutrition : Integrating Theories and Perspectives, Workshop presented at the Annual Meeting of the Society for Nutrition Education, July 2001 in Oakland California.

within Home Economics and Agriculture, a nutrition component within the health sciences, including medicine and public health was emerging as well. Public health nutrition, health education, health behavior and health promotion share common social and behavioral science roots with community nutrition, but are much more embedded in medicine. In 1990 Green both noted that much of the practice of health education is theoretical and speculated it may be due to the "quality of teaching about behavioral and educational theory in the health professions" (Green, p. xix in Glanz et al. 1990). Glanz et al. (1990) sought to "bring together important health behavior theories that are related to individuals as well as to communities..."

Drawing from multiple research perspectives and traditions, the common goal of public health (including public health nutrition) is to prevent disease and promote health (Stover 2003). While most community nutritionists share this goal, for some, the scope of practice also includes contexts such as community food systems and Cooperative Extension education through the Land-Grant University system.

During the 1990s, in addition to the development of related fields, the changing political and administrative contexts in which community nutrition has been positioned have changed it as well. There was a medicalization of nutrition, e.g., migration of the Food and Nutrition Board, which makes dietary recommendations to the U.S. National Research Council, to the Institute of Medicine. This not only affected the balance of prevention and treatment guidelines compared to health promotion, but also introduced the hierarchical character of medicine. This contrasts sharply to the web-like structures typical of community nutrition. Also the politicizing of nutrition and the concurrent shift from cooperative to controlling administrations in communities as well as in academia added additional constraints to community nutrition research and practice.

5. The evolution of theory in community nutrition

The use of theory has been a theme in community nutrition science the late 1970's when research in the field began to be taken seriously. However, the calls for theory development and application have not necessarily resulted in the widespread application of theory in either research or practice. In most cases in community nutrition, theories have come from the social sciences increasingly, researchers are developing models applied to community nutrition. The importance of theory to the field and some applications are

described in the next sections.

1) Theory informs research and practice

Theory is central to both research and practice as illustrated in Fig. 1. The application and development of theoretical frameworks is necessary for advancement of the field (Gillespie, Brun 1992). Theory has been defined as “an interrelated set of general statements that describe how the world works” (Gillespie, Brun 1992). Although practitioners may not see the usefulness of theory in their work, upon reflection, they often find they have their own theories of practice (Gillespie, Gillespie 1992). Theories of practice become more scientific as they are articulated and studied within community contexts. Theories are never perfect, but they do a better job of explaining with more study and use. “The value of theories is derived not from their permanence but from their contribution to the generation of new and better concepts and practices.” (Novak 1977)

For community nutrition practice, theory is essential for improvement because it connects findings from across programs and builds the knowledge base on which to develop future programs. Practitioners can improve their practice by expanding and improving their theoretical knowledge, i.e., their conception of how and why programs work or don't work. Sanjur (1982) discussed the need for theoretical frameworks in food habits research and emphasized the utility of applying theories and methodologies from the social sciences to understand food habits. Following an extensive review of the effectiveness of nutrition education (Contento et al. 1995), concluded that the most effective nutrition education programs are those which are “behaviorally focused and based on appropriate theory and prior research.” Theory-based community nutrition research allows studies to build on one another and develop a body of knowledge.

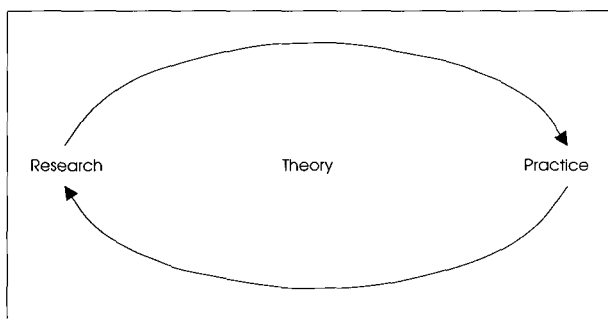


Fig. 1. Integration of research and practice in Community Nutrition.

2) Applications of theories in community nutrition

A discussion of the theories and models from the social and behavioral sciences that have been applied in community nutrition is beyond the scope of this paper. However, many of these can be found elsewhere (Achterberg, Clark 1992 ; Contento 1995 ; Glanz et al. 1990 ; Yarbrough 1981). Although early research and evaluation studies were often done in isolation, better connections through journals that publish community nutrition research have greatly improved the connectedness which facilitates theory development. Gillespie (1981) observed nutrition education studies of the 70's still lacked an explicit theoretical base. Much of the work in nutrition education was program evaluation (Brun 1980 for the distinction between evaluation and research), i.e., testing a particular program for its efficacy with a particular audience in a particular context. She called for “development and/or application of explicit theoretical frameworks or models which can be tested and improved upon and from which a body of generalizations may emerge to guide further research.”

Others have cited the limited use of theoretical frameworks in nutrition education (Achterberg et al. 1985 ; Gillespie Johnson, Johnson 1985 ; 1981 ; Sanjur 1982) to validate a theoretical model. “What is needed is a systematic program of high-quality research to validate a theoretical model that can be operationalized into actual nutrition education programs” (Gillespie, Brun 1992). Some have offered lists of theories and frameworks applicable to community nutrition from psychology (Contento 1995), within and education frame (Achterberg 1992 ; Johnson, Johnson 1985) and from Health Education (Glanz et al. 1990).

Gillespie and Brun (1992) noted a growing acceptance for the need for theory-based research in nutrition education and some studies using an explicit theoretical base as called for a decade earlier (Gillespie 1981). They reported that although 28% of the research articles in the *Journal of Nutrition Education (JNE)* from 1982 through 1987 made some reference to theory (awareness of the need), only 16% identified an explicit theoretical perspective. In the same anniversary issue of *JNE* (Achterberg, Clark 1992), reported on a more extensive review of *JNE* and dissertation abstracts from 1980–1990 and did not find the observed progress in use of theory encouraging. In preparation for this paper, a review of the *Journal of Nutrition Education and Behavior* for 2002–2003 by the author revealed that not quite half (12 of 26) of

the articles published even mentioned a theoretical framework. Achterberg et al. (1988) suggested a strategy for choosing an appropriate theory.

In the most recent extensive review of nutrition education research (Contento et al. 1995) discussed theoretical frameworks and models used by nutrition education researchers. These included the knowledge-attitude-behavioral model, health belief model, theory of reasoned action, theory of planned behavior change, and social learning theory. These are all models of individual behavior change, except for Bandura's "social cognitive theory," which also considers the influence of environment on behavior. "Stages of change" frameworks, "consumer information processing" models, "communications planning" models (including social marketing) and diffusion of innovations theory, as well as community and social change models were also cited. Contento et al. (1995) also noted that no studies used just one model or theory.

Although Contento et al.'s review showed considerable mention of theories and models in nutrition education research and evaluation, the field is still far from the goal of developing integrated theories. Although a review of methodologies for change programs as well as research is beyond the scope of this paper, tighter quantitative designs and more robust qualitative research and program evaluation are needed to build these theoretical frameworks and apply them to community nutrition.

3) Engaging families and communities in theoretical development and application

Engagement of community-based nutritionists in theory development has already been addressed, but families and communities can also be engaged through decision-making. The use of qualitative methodologies to develop theories grounded in the experience and perspectives of the interviewees began in the early 1980's in community nutrition. This methodology has become the major approach for some research groups.²³ Studies that construct theories in this way are more likely to engage participants in meaningful ways. However, as called for by the Kellogg report (1999), community members need to be engaged in the research and program development processes. Fig. 2 illustrates two models used by community nutritionists in working with communities for change. In the first, more common model, community

²³For example the food choice research group at Cornell University.

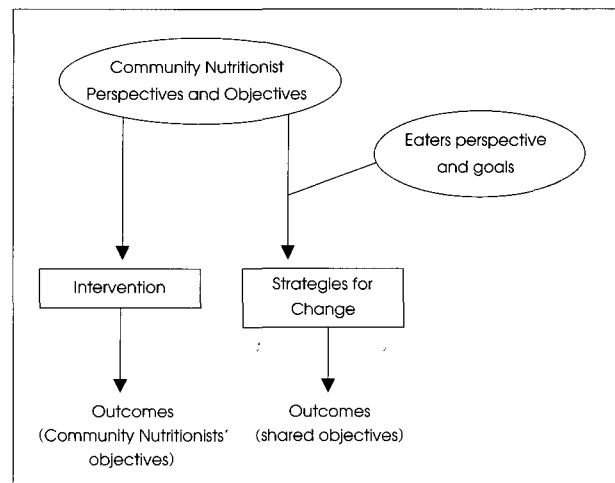


Fig. 2. Two paradigms for community nutrition change programs.

nutritionists identify important outcomes based on their understandings (through research or experience) of participant interests and needs. Projects are enriched by real community input into the decisions, not only about appropriate outcomes, but also strategies for change, and this builds community capacity. One example of a program that responds to community requests is the Family and Community Food Decision-making Program based at Cornell University and part of an extensive Food Web with connections not only within in the U.S., but also Korea and other countries. The program goal is to move from "build it and they will come" to "build it together and *they* will already be part of it" (Gillespie et al. 2003)

6. Framing the future

Returning to the fabric metaphor, characterizing the components that make up the fabric helps community nutritionists to think more systematically about the whole of community nutrition. Table 1 (described previously) depicts a way of organizing these concepts into a framework to characterize studies and programs within the larger context of community nutrition. It could also be used to frame a comprehensive review of community nutrition research and practice in the U.S. and elsewhere. If this or another common framework were used, community nutrition could be compared across countries to enhance the knowledge base for all communities and build toward more generalizable models of community nutrition. Working across countries can, as Mead (1943) observed, "provide cultural self-consciousness to place any set of activities within our society against the backdrop of a systematic knowledge of many

other cultures.” This frame integrates research and practice. But community nutrition is also about processes or methodologies for practice and research.

1) Structures and processes in community nutrition : the architecture of a spider web

The metaphor of a spider web²⁴ illustrates elements of structures and processes of community nutrition. Like Community Nutrition, a spider web does not have well defined boundaries and new connections are continually formed as old ones break apart. This metaphor for a largely non-hierarchical structure engages everyone’s expertise. Spider webs begin in the middle, are spun over time, represent many connections that make it a web and give it strength, stability, and most importantly, flexibility. Creating learning webs or networks is an important part of the practice of Community Nutrition, and is sometimes applied in research as well. Networks can grow and change to respond to current issues and research priorities. Networks, which evolve like spider webs, allow a group to address problems of communities and the people who live there as they evolve and the issues change. There are community nutritionists who see academia as the source of knowledge, others see communities as the only places where real and useful knowledge exists. Most community nutritionists understand the need for both, but see the appropriate balance at different points. As described by participants in the conference, *The Leading Edge in Nutrition Education : Research Enhancing Practice* (Brun 1987).

Practitioners see the forest,
 Researchers see the leaves,
 Working together, we can see the trees.

2) Future directions for community nutrition

The fluid, web-like nature of Community Nutrition is both its strength and its weakness. It allows both research and practice to remain relevant to current issues. Connections and strategic collaborations form and reform. At the same time, some practitioners and researchers see clear hierarchical structures, standard methodologies, and agreed upon definitions and outcomes as critical for a field to be recognized as legitimate within the contexts of academic and community structures, processes and reward systems.

Asking the appropriate questions is perhaps the most important step in guiding the future of community nutrition. *What would a systematic review of the literature reveal about community nutrition concepts and processes? Would the field be better served with tighter boundaries and more formalized structures? Should community nutritionists engage audiences or clients more meaningfully in research as well as practice of community nutrition? Should community nutritionists at times take critical perspectives and consider change in social and political systems as well as in individuals and families?* The answer to these questions and the application and development of appropriate theories and methodologies will shape the future of community nutrition.

Perhaps the biggest challenge is bringing together researchers and practitioners into a coordinated pursuit of knowledge and application that is enriched by the diverse experience, education, research, and practice from which community nutrition draws. The issues to be addressed by these collaborations include : 1) Theory development and application in research and practice within philosophically consistent perspectives ; 2) Methodological development (qualitative and quantitative) drawing from the social and behavioral sciences with unique applications to community nutrition ; 3) Taking a long view of community nutrition and recognizing that change requires integrated efforts over a long period of time ; and 4) Engaging community stakeholders in research as well as program planning and 5) Engaging with community nutritionists from other countries for cross-cultural research and conceptualization of community nutrition. This journal and the Korean Society for Community Nutrition can provide an excellent context for such collaborations.

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²⁴Credits to Sally Helgesen, Author of *The Web of Inclusion*, for the spider web metaphor.

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References

- Achterberg C (1988) : Qualitative methods in nutrition education evaluation research. *J Nutr Edu* 4(5) : 244-251
- Achterberg C, Clark KL (1992) : A retrospective examination of theory use in nutrition education. *J Nutr Edu* 24(5) : 227-233
- Achterberg CL, Novak JD, Gillespie AH (1985) : Theory-driven research as a means to improve nutrition education. *J Nutr Edu* 17(5) : 179-184
- Achterberg SL, Trekner (1990) : Developing a working philosophy of nutrition education. *J Nutr Edu* 22 : 189-193
- Axelson M, Brinberg D (1992) : The measurement and conceptualization of nutrition knowledge. *J Nutr Edu* 24 : 239-246
- Bass M, Wakefield L, Kolasa K (1979) : Community Nutrition and Individual Food Behavior Minneapolis : Burgess Pub Co
- Beffa-Negrini P, Cohen NL (1990) : Use of learning style theory in development of a nutrition education-program to reduce cancer risk. *J Nutr Edu* 22(2) : A100-B100
- Bisogni CA (2003) : Communicating about food choice : Tools for professional development. *SNE Annual Conference Handout*
- Bisogni CA, Connors M, et al (2002) : Who we are and how we eat : A qualitative study of identities in food choice. *J Nutr Edu* 34 : 128-139
- Brun J (1980) : Evaluating nutrition education programs : State of the art. *Food in Contemporary Society : Challenges for the '80's*. pp.60-60, Knoxville Department of Nutrition and Food Sciences, University of Tennessee
- Brun JK (1987) : Where are we going? *J Am Diet Assoc* 87(9 : Supplement) : 81-82
- Brun JK, Gillespie AH (1992) : Nutrition education research : Past, present and future. *J Nutr Edu* 24(5) : 220-221
- Coates TJ (1981) : Contributions of psychology to nutrition education research. *J Nutr Edu* 13(1) : s34-s52
- Contento I, Balch GI, Bronner YL, Lytle LA, Maloney SK, Olson CM, Swadenera SS (1995) : The effectiveness of nutrition education and implications for nutrition education policy, programs, and research : A review of research. *J Nutr Edu* 27(6) : 381-418
- Contento I, Balch GI, Bronner YL, Lytle LA, Maloney SK, Olson CM, Swadenera SS (1995) : Theoretical frameworks or models for nutrition education. *J Nutr Edu* 27(6) : 287-290
- Contento I, Murphy B (1990) : Psycho-social factors differentiating people who reported making desirable changes in their diets from those who did not. *J Nutr Edu* 22 : 6-14
- Cornell University (2002) : Community and international nutrition at Cornell university graduate program in nutritional sciences
- Deacon RE, FM Firebaugh (1988) : Family Resource Management : Principles and Applications. Boston, Allyn and Bacon, Inc
- Editorial (2003) : Practice is the purpose of public health. *Am J Pub Heal* 93(No. 11)
- Endres J (1999) : Community Nutrition, Challenges and Opportunities, Prentice Hall Inc
- Eppright E, Pattison M, Barbour H (1957) : Teaching Nutrition, The Iowa State University Press
- Espy M (1993) : Nutrition : Eating for Good Health, United States Department of Agriculture, Agriculture Information Bulletin 685
- Fishbein M, Ajzen I (1975) : Belief, Attitude, Intention, and Behavior : An Introduction to Theory and Research. New York, Addison-Wesley
- Giff H, Washbon M, Harrison G (1972) : Nutrition, Behavior and Change. Englewood Cliffs, NJ, Prentice Hall Inc
- Gillespie AH (1981) : Applying communication theory in nutrition education research. *J Nutr Edu* 13 : s29-s33
- Gillespie, Ardyth H (1975) : M.S. thesis, Iowa State University
- Gillespie AH (1989) : Nutrition Education : A provocative look at current research. Presented at annual research meeting of the American Dietetics Association. Orlando, Florida, April 28
- Gillespie AH (1998) : Developing a university-community partnership model integrating research and intervention to improve food decisions in families and communities. *Korean J Comm Nutr* 3(1) : 120-132
- Gillespie AH (2002) : How your community affects your food choices. *J Family Consum Sci* 94 : 66-67
- Gillespie A, Brun J (1992) : Trends and challenges for nutrition education research. *J Nutr Edu* 24(September/October) : 222-226
- Gillespie AH, Dischner K, Gantner L, Howard H : Building community webs : The family and community food decision-making program. <http://www.cce.cornell.edu/programs/foodsystems/>
- Gillespie AH, Gantner L, Craig S, Dischner K, Lansing D (2003) : Productive partnerships for food : principles and strategies. *J Extension* 41(No. 2).
- Gillespie GW, A, Gillespie H (1992) : Applying Theory in Nutrition Education--SNE Workshop. Society for nutrition education workshop on Applying theory in nutrition education practice and research, Washington, DC
- Gillespie Jr GW, Gillespie AH (2000) : Grounded theory, collaborative style. Ithaca, NY, Division of Nutritional Sciences, Cornell University
- Gillespie AH, Yarbrough P (1984) : A Conceptual model for communicating nutrition. *J Nutr Edu* 16(4) : 168-172
- Glanz KA, Hewitt M, et al (1992) : Consumer behavior and nutrition education : An integrative review. *J Nutr Edu* 24(5) : 267-277
- Glanz K, Lewis FM, et al, Eds (1991) : Health Behavior and Health Education : Theory Research and Practice. San Francisco, CA, Jossey-Bass Publishing
- Green LW (1990) : Foreword. Health Behavior and Health Education Theory Research and Practice. San Francisco, Jossey-Bass Inc
- Guthrie H (1977) : Educational notebook : Guidelines for academic preparation of community nutritionists. *J Nutr Edu* 9(1) : 35
- Guthrie H (1982) : Nutrition education-challenges and partnerships. *Food Nutr News* 54(1) : 1-4
- Helgesen S (1995) : The web of inclusion : A new architecture for building great organizations. New York : Currency/Doubleday
- Hochbaum GM (1981) : Strategies and their relationships for cha-

- nging people's eating habits. *J Nutr Edu* 13(1) : s59-s65
- Hovland C, Janis I, Eds (1959) : Personality and Persuasibility. Yale University Press, New Haven, CT
- Jerome N, Kandel R, et al, Eds (1980) : *Nutritional Anthropology Contemporary Approaches to Diet & Culture*. Pleasantville, Redgrave Publishing Company, NY
- Johnson DW, Johnson RT (1985) : Nutrition education : A model for effectiveness, a synthesis of research. *J Nutr Edu* 17(2) : Supplement
- Keenan DP, Olson C, et al (2001) : Measures of food insecurity/ security. *J Nutr Edu* 33 (Suppl 1) : S49-S58
- Kellogg Commission (1999) : Returning to our roots : The engaged institution. Kellogg Commission on the Future of State and Land-Grant Universities, *J Am Diet Assoc*, p.57
- Kirk M, Gillespie A (1990) : Factors affecting food choices of working mothers with young families. *J Nutr Edu* 22(4) : 161-168
- Lazarsfeld P (1949) : Communication research. Current trends in social psychology. pp.218-273, University of Pittsburgh Press, Pittsburgh, PA
- Leverton RM (1974) : What is nutrition education? *J Am Diet Assoc* 64 : 17-18
- Levy S (1980) : Nutrition-education research : an interdisciplinary evaluation and review. *Health Education Quarterly* 7 : 107-126
- Leverton RM (1960) : *Food Becomes You*, The Iowa State University Press
- Lewin K (1943) : Forces behind food habits and methods of change. pp.35-65, National Academy of Sciences
- Lowenberg, Todhunter, et al (1968) : *Food & Man*. New York, Wiley and Sons, Inc
- Lyman B (1989) : *A Psychology of Food : More Than a Matter of Taste*. New York, NY, Van Nostrand Reinhold
- Matheson DM, Woolcott DM, et al (1991) : Evaluation of a theoretical model predicting self-efficacy toward nutrition behaviors in the elderly. *J Nutr Edu* 23(1) : 3-9
- McKenzie J, Mumford P (1965) : The evaluation of nutrition education programmes : a review of the present situation. *World Rev Nutr Diet* 5 : 21-31
- Mead M (1943) : Dietary patterns and food habits. *J Am Diet Assoc* 19 : 1-5
- Mead M (1943) : The problem of changing food habits. The Problem of Changing Food Habits. pp.20-34, National Research Council, Washington, DC
- National Research Council (1943) : The Problem of Changing Food Habits. pp.20-34, National Research Council, Washington, DC
- Novak J (1977) : The central role of learning theory in a theory of education. *A Theory of Education*. pp.64-93, C.U. Press. Cornell University Press, Ithaca
- Obert J (1977) : *Community Nutrition*. Macmillan Publishing Company, New York, pp.7-7
- Olson CM, Gillespie AH (1981) : Proceedings of the workshop on nutrition education research : Applying principles from the behavioral sciences. *J Nutr Edu* 13(1s) Encyclopedia of
- Owen A, Frankle R (1986) : Planning and decision making in community nutrition to produce outcomes. *Nutrition in the Community : The Art of Delivering Services*. pp.37-65, Times Mirror/Mosby, St. Louis, MO
- Pelletier, Kraak DV, McCullum C, Uusitalo U, Rich R : Community food security : Salience and participation at community level. *Agriculture and Human Values* 16 : 401-419
- Pelto GH (1981) : Anthropological contributions to nutrition education research. *J Nutr Edu* 13(1) : s2-s8
- Roderuck C (1978) : Current Studies as Bases for Future Research in Nutrition Education. *Nutrition Education Research : Directions for the Future*, Chicago, IL
- Sadler MJ (1999) : *Encyclopedia of Nutrition : Community Nutrition*. Academic Press, San Diego
- Sanjur D (1982) : *Social and Cultural Perspectives in Nutrition*. Prentice-Hall INC, New Jersey
- Sims L (1981) : Toward an understanding of attitude assessment in nutrition research. *J Am Diet Assoc* 78 : 460-466
- Stage S, Vincenti V (1997) : *Rethinking Home Economics*, Cornell University Press, Ithaca, NY
- Stover G, Bassett M (2003) : Practice is the purpose of public health. *Am J Pub Heal* 93 : 1799-1801
- Tate M (1961) : *Home Economics as a Profession*. McGraw-Hill Book Company, New York
- Travers KD (1997) : Nutrition education for social change : Critical Perspective. *J Nutr Edu* 29(2) : 57-62
- Ullrich HD (1992) : The SNE Story : 25 Years of Advancing Nutrition Education. *Nutrition Communications Associates*, Berkeley, CA
- Watzlawick P, Beavin JH, et al (1967) : *The Frame of Reference. Pragmatics of Human Communication : A Study of Interactional Patterns, Pathologies, and Paradoxes*. pp.8-71, W.W. Norton and Company Inc, New York
- Whitehead F (1973) : Nutrition education research. *World Rev Nutr and Diet* 17 : 91-149
- Wilkins JL, Kraak V, et al (2001) : Moving from debate to dialogue about genetically engineered foods and crops : Insights from a Land Grant University. *J Sustain Agricul* 18 (2/3) : 167-201
- Wright H, Sims L (1981) : *Community Nutrition : People, Policies, Programs*. Wadsworth Publishing, Belmont, Ca
- Yarbrough P (1981) : Communication theory and nutrition education research. *J Nutr Edu* 13(1) : S16-S27